Executive Guide to Offshore IT Services for U.S. Companies



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About This Executive Guide

This Executive Guide presents a summary of research findings into an area of current and vital interest to executive decision makers. It provides key pointers for decision makers who require:

- A snapshot of current trends
- A summary of the most recent research
- A guide to some of the leading information technology suppliers

This is one of a series of INPUT guides covering the following IT and business sectors:

- Electronic Commerce
- Electronic Banking
- Electronic Government
- Enterprise Application Solutions
- Internet & Intranet
- IT Customer Services & Support
- IT Operational Services

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About INPUT

Information Technology (IT) decision makers throughout the world rely on INPUT for data, research, objective analysis and insightful opinions to:

- Ensure an effective investment strategy
- Evaluate and select suppliers
- Save time in evaluating industry developments
- Avoid problems encountered by other organizations

Since its founding in 1974, INPUT's focus in the IT software and services industry has helped many of the world's leading companies to make key decisions not just about technology itself but, more importantly, about the application of technology to their specific business needs.

See inside back cover for more information on INPUT's services.
See back cover for details of INPUT offices.

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USA

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Introduction

There is a growing trend among U.S. companies to take advantage of resources located outside the country in addressing their information technology (IT) services needs. In the past, the attraction of using offshore resources was in the opportunity to tap pools of low-cost talent. Today, offshore IT services have evolved to the point where they offer world-class -- and often unique -- services or capabilities in their own right. In many cases, offshore firms are able to provide services that either are not available from U.S. suppliers, or are superior to those available locally.

The trend towards using offshore services and resources has been fuelled in recent years by the significantly improved depth and quality of services offered combined with new technologies and the Internet. The latter are erasing geographic boundaries and making it easier for firms to deliver services regardless of the physical location of the customer or service provider. However, many senior IT executives remain unaware of recent developments and perceive offshore services as providing low-cost, and often low-quality, programming capabilities.

This *Executive Guide to Offshore IT Services for U.S. Companies* provides senior management with an executive-level perspective on offshore IT services. It also provides recommendations and observations based on interviews with senior IT management at 100 of the top 1,000 companies in the U.S., discussions with over 100 offshore services providers in Europe, Asia and the Middle East and secondary research.

This *Executive Guide* also provides profiles of 20 selected firms offering services that tap offshore resources based on contacts with hundreds of firms providing offshore IT services across the world. To help executives understand the diversity of the firms behind the growing offshore IT services activity, INPUT has selected a cross-section of services providers notable for their capabilities, service offerings, skill sets or approach.

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Executive Summary

The number of companies that are leveraging global resources and looking beyond national boundaries to meet their IT service needs is growing, just as the number of companies that are expanding to address global markets is on the rise.

Historically, U.S. companies have relied on local, American resources to meet their need for professional information technology (IT) services. However, this is changing and the pace of change is expected to increase significantly over the next few years.

More and more organizations are turning to IT services providers that use resources outside the U.S. Indeed, a significant percentage are already using offshore IT services. In some cases, these services are purchased and managed through vendors headquartered in the U.S.; in other cases, it is through foreign companies selling through local branch offices.

There are two key trends driving this growing use of offshore IT services:

1. **The world is getting smaller**. Whether the resources of a services supplier are located next door or on the other side of the globe is becoming increasingly transparent to the users of IT services. On the one hand, technology -- particularly the Internet -- is making it easier, cheaper and faster to communicate across vast distances. Distance is becoming less of a factor in delivering any kind of service.

   At the same time, experience, contact and awareness have helped to make language and culture less of an issue in delivering offshore services.

2. **The depth and quality of offshore services has advanced significantly**. Offshore IT services providers have come a long way over the past few years. The range and quality of services offered are comparable with, and in some cases exceed, those available from American suppliers. More significantly, some offer services, products or capabilities that are unique and simply not available elsewhere. Examples include firms with skills in combining Web-enablement with industry-specific competencies.

Contrary to popular opinion, cost alone is not one of the more significant factors driving the growth of offshore services. While offshore services providers are helping to lower the cost of IT services, particularly in applications development and maintenance, American executives are looking beyond cost alone for value and quality solutions to their needs.

A factor helping to spur the growth of offshore services is the importance of choice for IT decision-makers. IT management have always been attracted to market changes that provide greater choice, more options and the opportunity to gain better leverage with existing suppliers.

In the 1970s, plug-compatible manufacturers provided an alternative and leverage point when purchasing IBM mainframes. In the 1980s, 'open systems' generated strong interest because of its promise of a wide range of choice and options. Today, offshore services providers are helping to extend the range of choice available to IT decision-makers looking for quality services.

One key observation from this study is that perception lags reality. There seems to be a lack of awareness about what is available today from vendors offering offshore services or resources. Specifically, the perception of most of the senior IT management interviewed, particularly those that have never used offshore services, was that offshore services providers offer low-cost -- and often low-quality -- programming capabilities.

While this may have been true a decade ago, it is not the case today. In fact, the offshore services providers at the forefront of the market are focused on selling leading-edge services rather than low-cost services. And, the experience of the executives interviewed that had used offshore services validated this change. Going into the project, these executives were looking primarily for lower cost and improved productivity from their offshore supplier. However, most went on to comment that the key benefits realized from the project were access to expertise and unique skill-sets.

Current Use and Experience

The use of offshore services and resources by U.S. companies is more pervasive than most senior IT management realize.

Eighteen of the 100 senior IT executives interviewed said that they have used, or are currently using, offshore IT services. However, INPUT believes that the percentage of Fortune 1,000 companies using offshore services is double the 18% indicated in this survey, based on a variety of industry sources. In fact, many of the organizations surveyed where senior executives said they have not used offshore services are known to have used, or are using, offshore IT services.

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There are several reasons for this:

1. Often offshore IT services are subcontracted, and the customer is not aware that offshore resources are being used.
2. Many executives are simply unaware that the services provider they have contracted is relying on offshore resources, in part because the use of offshore resources is increasingly transparent to the user.
3. Senior IT executives may not be aware that a division or offices within the organization are using an offshore services provider.

Those executives surveyed that were aware of having used offshore IT services indicated that they had primarily used software development, application/product maintenance or outsourced operations services.

The level of satisfaction with offshore services providers on the part of those that have used them was high (see Exhibit I). In recent INPUT studies, the average satisfaction level for outsourced operations was 3.8 on a scale from 1 to 5 (with 5 being extremely satisfied). The average satisfaction rating for offshore IT services was 4.3.

A key factor behind the high satisfaction levels is the strong process management orientation of most offshore services providers. Because of the time and distance between the customer and the place where the work is done, offshore vendors have found that a critical success factor for offshore projects is to follow carefully laid out processes and procedures. Expectations and specifications are carefully detailed and confirmed at the beginning of the project. Progress is carefully monitored against agreed milestones. Any changes are documented and confirmed.

Given their strong focus and capabilities in project management and service processes, it is not surprising that offshore IT services providers are among the leaders in obtaining process-oriented, internationally recognized certification, such as ISO or CMM.

Most executives surveyed were using offshore services providers in conjunction with other, local services providers (see Exhibit II).

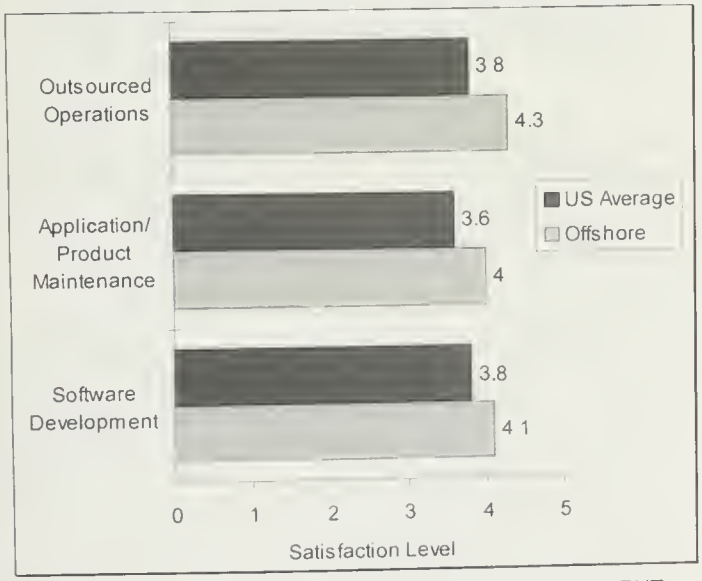
In some cases, offshore services providers were seen primarily as a back-up to other providers. In fact, many of those surveyed, including those that had not used offshore services, saw offshore services as an important back-up for situations in which their 'usual' services provider was resource-constrained.

There are a variety of indicators showing that users and vendors alike are finding it difficult to obtain needed staff in many key areas. As this personnel shortage grows more acute, a growing number of American companies are turning to offshore services providers to fill the gap.

In addition, users are looking for flexibility. When work exceeds the resources available, they can outsource to offshore suppliers, and when resources are freed up or when demand slows they can bring the work back. This eliminates problems of hiring and releasing staff, as well as the difficulties related to fluctuating staff numbers in IT-related industries.

Exhibit I

Offshore IT Services Satisfaction Levels

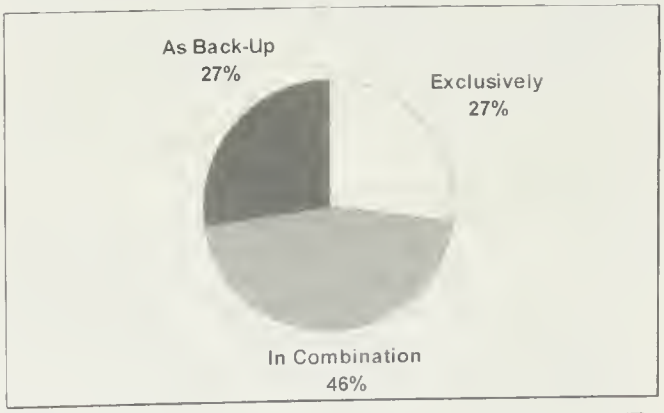


Sample: 18 *Source: INPUT*

*Note: a rating of 3.3 or lower should be interpreted as **Low**, 3.4 to 3.8 should be interpreted as **Medium** and 3.9 or higher should be interpreted as **High***

Exhibit II

Use of Offshore and Local Services Providers



Sample: 18 *Source: INPUT*

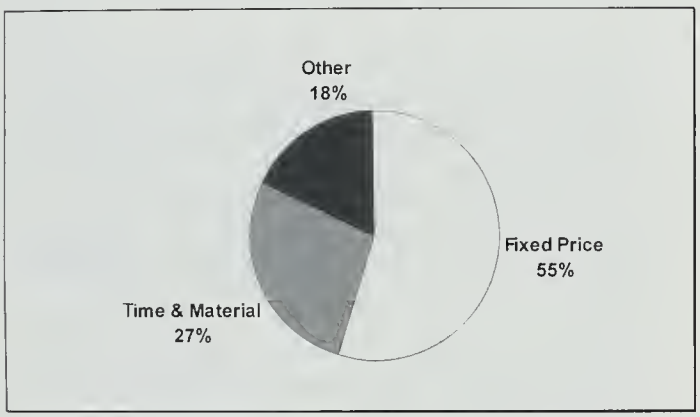
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Increasingly offshore vendors, in turn, are taking advantage of such opportunities to move from being the 'back-up' services provider to the 'usual' services provider.

Most of those surveyed worked with their offshore services provider on a fixed-price contract (see Exhibit III). However, both users and vendors seem to be increasingly creative in their contract arrangements. While a growing interest was expressed in value-based pricing of services, few seem to be actually going down this route. One reason seems to be the simplicity of a fixed-price contract for both the services provider and the user.

Exhibit III

Contract Pricing Used



Sample: 18 *Source: INPUT*

Issues and Concerns

The executives surveyed, particularly those who had never used offshore services previously, described a number of issues and concerns regarding the use of offshore services or resources.

Control: About two-thirds of those surveyed felt that dealing with an offshore provider would result in less control. The view expressed was that the level of project control the customer has is inversely proportional to the physical distance between the vendor and the customer. The concern is that distance and differences in time zones would conspire to reduce control over a project handled by an offshore supplier.

Some respondents also noted a concern that it would be hard to "crack the whip" if a services provider is half-way across the world. Yet, as noted above, the fact that offshore services resources are located thousands of miles away is becoming increasing transparent to the users of these services.

Also, contrary to the views of some of those interviewed in this survey, the findings from this study indicated that most offshore services providers offer a higher degree of control to their customers. There are two factors behind this:

1. Most offshore providers are very aware of the concerns of their customers and go to great lengths to address those concerns. Through a combination of offices in the U.S. and on-site liaison staff, there is usually a fairly high degree of communication and contact between the vendor and the customer.
2. The strong process-management orientation of most offshore services providers provides both the provider and the customer with the ability to monitor progress, as well as to quickly identify and address problems.

While control appears to be less of a potential problem when using offshore resources than many executives perceive it to be, it is an area of concern that needs to be addressed. In evaluating potential offshore services providers, executives should ensure that their potential services provider is able to provide adequate means of project monitoring and control.

Risk: About a third of the executives surveyed noted that using offshore services providers is not the 'established option'. Because it is not seen as the 'established' option, there was the perception among some of those interviewed that the decision to use offshore services providers carries a greater risk if something goes wrong.

Just as it was once a truism that 'no one ever got fired for buying IBM', the view of some is that the safer choice is the best choice. And, using offshore suppliers is not seen as a safe choice.

Some also noted that, while they personally were interested in using offshore suppliers, getting approval for deals involving offshore suppliers was more difficult.

This is one reason why offshore resources are often addressed through subcontract arrangements. Well known US-based vendors will be used as the prime contractor, with most of the work actually done offshore by a subcontractor.

This concern reflects the lack of awareness about offshore services noted earlier, and is expected to continue to be an issue for at least another one to two years. As senior executives increasingly realize the benefits to be derived from looking globally for the IT services needs, the perception that using an offshore services provider is risky will disappear. In the meantime, concerns about the risk of going with an offshore supplier will continue to slow down the growing use of offshore resources.

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Culture/Language: About a quarter of the executives surveyed mentioned concerns that culture and/or language would be an issue when using offshore services providers.

However, with the more established and experienced offshore services providers, there are few if any problems in this area. Comments from those using offshore services indicate that culture or language is not an issue, *when using more established firms*. Given their long tradition in dealing with and selling to U.S. companies, they seem to be experienced at making it transparent to the customer that they are dealing with a foreign services provider.

However, language and culture are problematic when dealing with vendors from countries that have only recently come into the U.S. services market. These include China, Indonesia and the Latin American countries.

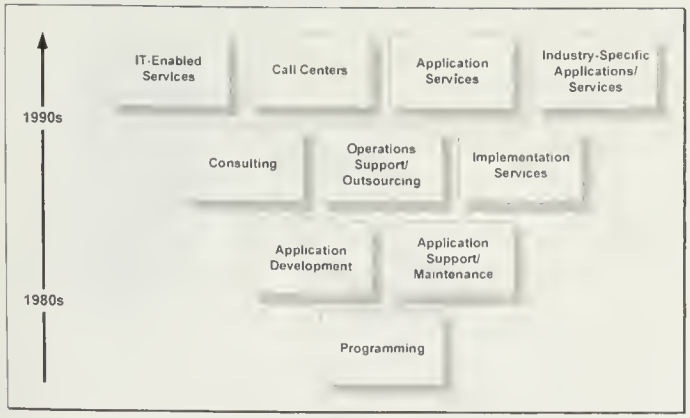
INPUT's recommendation is that a services provider's experience in dealing with American companies be considered in the evaluation process. Anticipate that there could be problems, miscommunication, or misunderstandings with those vendors with limited experience in dealing with America customers.

What is Being Offered?

The breadth and depth of services offered by offshore vendors, or using offshore resources, has grown significantly, especially over the past few years. Vendors that first entered the market offering low-cost programming resources have matured beyond their 'body shopping' roots to offer an often impressive array of services and capabilities. At the same time, new players have entered the market to fill their place in providing low-cost programming services.

Exhibit IV

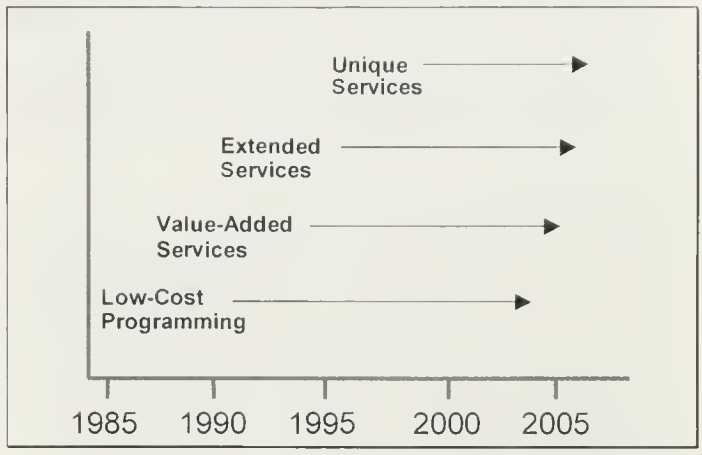
Extended Range of Services Offered



Source: INPUT

Exhibit V

Offshore Services Moving Up the Value Chain



Source: INPUT

Over the past 15 years or so, offshore vendors have been moving up the value chain. In the late 1980s and early 1990s they began adding value to the services provided. Today, there are a growing number of offshore vendors offering innovative, state-of-the-art services. Unfortunately, these world-class vendors are often perceived as being low-cost, low-value suppliers either because of their past activities or by simply being headquartered in a developing country.

INPUT has identified four areas in which offshore vendors are emerging as key players in providing services to companies in the U.S.:

IT-Enabled Services

Offshore IT-enabled services are functions or services that are delivered over telecommunications or data networks (wireline and wireless). Examples include call centers, customer management/care, back office operations (e.g., payroll, accounting, other ancillary operations), medical transcription, insurance claims-processing, legal databases, content development, animation and logistics management.

In many of these areas, offshore vendors provide innovative, state-of-the-art services.

Industry-Specific Services

As offshore vendors look to differentiate themselves, many are choosing to focus on industry-specific niches and expertise.

Over the years, some offshore vendors have gained an intimate knowledge of specific industries by developing tailored applications in those industries. They are now using that industry-specific expertise to provide industry-specific services and products.

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Among the profiles of the attached 20 selected offshore services providers, one can find vendors with strong industry-specific capabilities in telecommunications, discrete manufacturing, process manufacturing, banking, insurance and financial services. Expect to see some offshore vendors being counted among the leaders in providing IT services to some of these industries.

Web/E-Business Services

Given that the Internet has helped to remove distance and borders as barriers to business, it is not surprising that offshore vendors are placing a heavy emphasis and focus on building and enhancing their Web and e-business services capabilities.

Offshore services providers are helping established companies build or extend their e-business applications, Web sites and resources, as well as helping new 'dot com' companies get up and running quickly. In fact, few realize the extent to which the 'dot com' companies have been turning to offshore services providers to help them get going quickly yet inexpensively.

Quick Time-to-Market

In an environment where time-to-market can mean the difference between success and failure, and where increasing numbers of companies are operating on "Internet time", offshore vendors have realized that speed can be a big advantage.

A key element in delivering quick time-to-market services is by combining quality development staff with 24 x 7 activity. It is easier outside America to find and keep experienced, qualified staff willing to work unusual hours and in shifts. The result is that delivery time can be reduced with little or no impact on quality.

Many of the executives surveyed that had been using offshore services list this an area where specific benefits had been achieved, citing the ability to "bring new systems on stream quickly". Several commented that it was the speed of implementation combined with the reliability that had delighted them.

By Whom?

There are, literally, hundreds of companies selling offshore IT services and products to American companies. Historically, the leading offshore services providers have been based in India, Ireland, Israel and the Philippines. Today, vendors from these countries are taking the lead in providing new, innovative and state-of-the-art services and products. They are also more experienced in dealing with American companies.

While vendors from these countries have been moving more up-market, vendors from such countries as Bangladesh, China, Indonesia, Latin America (e.g., El Salvador, Honduras and Mexico) and Eastern Europe (e.g., Latvia, Lithuania and Russia) have come into the market. Their focus tends to be on offering low-cost programming, maintenance and application-development services.

Major global services providers are also leveraging global resources to gain a competitive edge. IBM, Origin, PricewaterhouseCoopers, Siemens and Software AG are but a few examples of well-known vendors with major offshore development, or services, capabilities.

One key challenge for executives considering services that leverage offshore resources is finding the right vendor. With the large number and wide diversity of offshore vendors, it is difficult for potential users to distinguish the good from the bad -- to identify the most experienced and most appropriate vendor. This is compounded by the difficulty of physically viewing, or touring, facilities that may be half a world away.

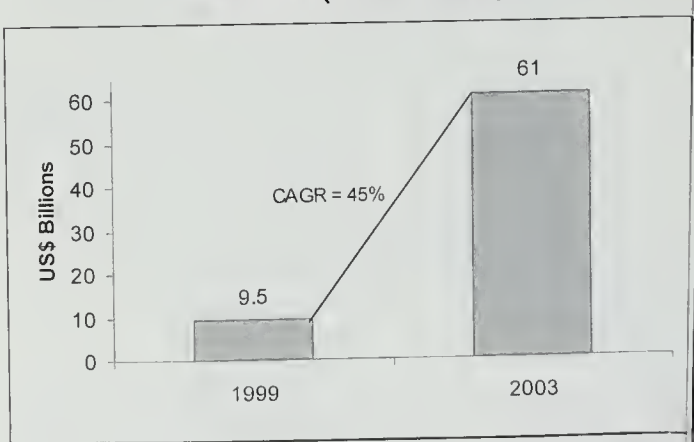
A Rapidly Growing Component of the Market

The use of offshore services and resources in the U.S. is on the rise. Most offshore vendors are seeing revenue growth of 40 - 80%, and some are even experiencing triple-digit growth.

Last year, INPUT estimates that U.S. and Canadian companies spent US$9.5 billion on offshore services. By 2003, this is expected to reach US$61 billion, representing a 45% compound annual growth rate.

Exhibit VI

North American Market for Offshore IT Services (1999 - 2003)



Source: INPUT

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A growing awareness and acceptance of offshore vendors by American executives is helping that growth. Unexpectedly, one of the biggest factors that has helped to drive the use of offshore services providers in the U.S. was the Year 2000 issue.

Over the past few years, companies had been turning to offshore vendors to help them with their Y2K compliance work. Those offshore vendors appear to be turning most of those short term, one-time projects into long-term business, which says a lot about the capabilities of these services providers and the value of a strategic partnership with offshore services providers.

Recommendations

In light of this study, INPUT offers the following recommendations:

- Explore what is available from offshore services providers, and keep them on your 'radar'. At the very least, this knowledge could provide some leverage in negotiating with current providers.
- When evaluating an offshore services provider, as with any potential services provider, look for more than just a vendor of services. Look for a partner.
- As part of the process of looking for a partner, check out a potential vendor carefully. Talk to references, check out their experience, look at their capabilities, and make sure that there is a good fit between your organization and the vendor. As noted above, INPUT also recommends that a services provider's experience in dealing with American companies be considered in the evaluation process.
- Consider initiating one or two pilot projects with the intent of having offshore services as a strategic option. Undertake the pilot projects in low-risk areas, but with clearly defined objectives and evaluation criteria.

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Profiles

Profiles of Selected Offshore IT Service Providers

BFL Software Partners In Progress 11

CBSI Complete Business Solutions Inc 15

FORSOFT 19

HCL 23

HEXAWARE TECHNOLOGIES, INC. 27

iflex i-flex solutions ltd. 31

INTELLIGROUP 35

iis 39

LST LEVERAGE SYSTEMS TECHNOLOGIES, INC. 43

LINC SOFTWARE 47

Mahindra CONSULTING 51

MAJESCO A MASTEK SUBSIDIARY 55

Onward Technologies Ltd 59

ORIGIN 63

..... 67

POLARIS 71

PRICEWATERHOUSECOOPERS 75

SVI CORPORATION 79

SONATA 83

ZenSar 87

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BFL Software Limited

Contact Information

U.S. headquarters
BFL Software Ltd.
333, Cobalt Way, Suite#107
Sunnyvale, CA 94086

Telephone: (408) 730 8334
Fax: (408) 730 1611

Mr. K. Sridharan
CEO
Email: achivers@bflusa.com

India headquarters
BFL Software Ltd.
139/1, Hosur Road, Koramangala
Bangalore - 560 095

Telephone: (91-80) 5522 713
Fax: (91-80) 5522 719

Mr. R. Mohan
Managing Director
Email: achivers@bflsoftware.com

www.bflsoftware.com

Company Background

BFL Software Limited was founded in 1992, and today has an employee strength of more than 1,050. Headquartered in Bangalore, India, with a current market capitalization of over US$ 200 million, BFL Software has a majority holding by Barings India Investment Ltd., an investment company of the ING group, a leading global financial services group based in the Netherlands. BFL Software's mission is to become a global leader in the software industry by ensuring the highest levels of customer satisfaction.

BFL Software already has a global presence in over 15 countries, including offices in the United States, Canada, UK, Germany, Netherlands, Singapore, Japan and Australia. In Fiscal Year 1998-99, the company achieved revenues in excess of US$ 23 million.

BFL Software is ISO 9001 certified under the TickIT scheme, and has been rated company-wide at SEI CMM Level 4.

BFL Software

- ✓ Software solutions include: software development, migration and porting, maintenance, and IT enabled services
- ✓ Industry and application focus includes; Financial Services, Telecommunications, Healthcare, Airline & Airports, and Customer Delivery Management
- ✓ Established Collaborative Onsite Offshore Model (COOM)
- ✓ SEI CMM Level 4 and ISO 9001 certified
- ✓ Software Quality Process consulting
- ✓ Consulting & Implementation of ERP and popular business applications

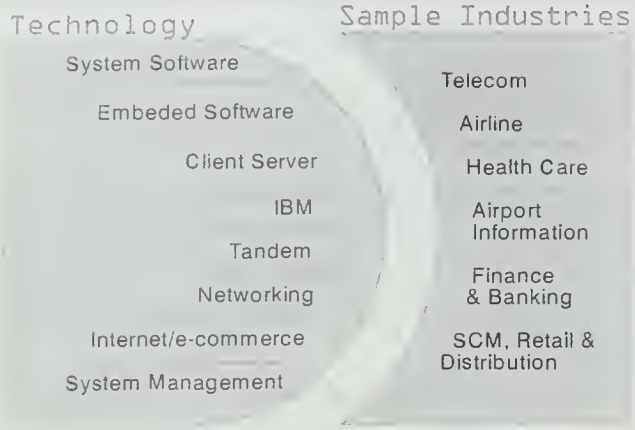
Their client base boasts a number of Fortune 500 organizations, each of whom are world leaders in their respective fields. BFL Software has executed several projects for such clients using their unique *Offshore Dedicated Center* approach.

Main Business Activities

BFL Software provides IT solutions for a spectrum of industries and these solutions are built across a range of operating systems and platforms made possible through a resource pool with skills in various languages, database, middleware and GUIs, specific software tools and networking protocols. BFL Software offers software quality process consulting services and consulting and implementation services for popular ERP packages (e.g. PeopleSoft), and other business applications. BFL Software's service offerings and technology areas can be broadly classified into:

- Customized software development
- Re-engineering and reverse engineering
- Sustenance and maintenance
- Porting and migration
- Quality process consulting
- IT enabled services
- Implementation & Customization of Packaged Applications

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BFL Software has also developed e-solution products for the Indian and international markets.

BFL Software's Industry Expertise

BFL Software has built an extensive client base spanning a broad spectrum of industries. Their ability to forge fruitful long-term relationships with clients has endowed them with the expertise, as well as the experience, to offer in-depth IT solutions across several vertical segments. BFL Software's main industries and application areas include Financial Services, Telecommunications, Healthcare, Airline & Airports, and Customer Delivery Management.

Offshore Service Capability

BFL Software's approach to offshore services offers clients a cost effective and quality solution that helps them reduce the time to market and lower overheads. Their Collaborative Onsite Offshore Model (COOM) combines an onsite coordination presence with an offshore execution team to help better understand and address customer requirements.

BFL Software has multiple well-equipped development centers spread over an area of 170,000 sq. feet in Bangalore. Housing state-of-the-art hardware and software tools from leading computer vendors, each center has global data communications links that enables constant interaction between engineers and clients, enabling effective software development and project management.

BFL Software offers the following offshore services:

Software Development

BFL Software has developed a host of applications, systems, networking, telecommunications and Internet/ E-commerce software on a variety of systems including Tandem, IBM Mainframe, IBM AS/400, Windows family, Unix flavors and Linux.

Migration and Porting

BFL Software has extensive expertise in helping clients migrate from legacy systems to client/server and Web-based systems, as well as having converted programs from one environment to another.

Maintenance & Sustenance

BFL Software has experience in operating dedicated offshore software maintenance & sustenance teams for international clients, both for supporting applications and systems software.

IT Enabled Services

BFL Software offers publishing, call center and simulation development services.

Coupled with the above services, BFL Software's quality assurance team has helped clients in analyzing their quality systems and arriving at an analysis of the gap between their 'as-is' and 'to-be' states.

BFL Software brings added value to engagements through:

Project Management

BFL Software has a project management experience of over 6000 person years in offshore development, for a global clientele comprising over 15 Fortune 500 companies. Their project review and correction techniques have helped them deliver quality software on time and within budget to enhance the time-to-market capabilities of clients.

Effective Communication

BFL Software's unique business model – the Collaborative Onsite Offshore Model (COOM) offers the key advantage of good communication. The on-site coordinator(s) interact with the client on a daily basis ensuring complete understanding of the client requirements and smooth flow of information to the offshore team.

Long term-Relationships

BFL Software is committed to building long term relationships with its clients, which is reflected in the company motto of "*Partners in Progress*". However it is more than just a statement, this vision forms a distinctive part of an established practice within the company, which is demonstrated by the fact that, despite its annual growth rate of 60%, nearly 85% of the work that BFL Software does today is for existing customers. Their commitment to customers has helped them build and maintain offshore dedicated centers for nine clients.

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Quality Professionals

India has a large resource pool of software professionals and educational institutions. BFL Software's brand image and reputation ensures that the company is able to attract the best talent. Employee training needs are continuously monitored by BFL Software's in-house Educational Services Group (ESG). Their effective training methodology and experienced faculty (both in-house and externally sourced) ensures clients have access to highly qualified professionals. The ESG also imparts training programs on leading edge technologies, ensuring BFL Software is abreast of the latest developments of the global software industry.

Product Platforms

BFL Software has expertise in the following areas:

User Interface & Languages: Java, Delphi, ASP, Visual Café, Visual Basic, Power Builder, VC++, PL/1, HTML, XML
Tools: Designer 2000, BACHMAN, Rational Rose, ER-WIN, ClearCase, MS Project, SCMS, PVCS, Visual Source Safe
Operating Systems: UNIX Flavors, Windows Family, OS/400, OS/390, MVS, NS Kernel, NetWare
Network Protocols: TCP/IP, RSVP, UDU, ATM, ISDN, ADSL
Middleware: Tuxedo, CORBA, OFX, COM/DCOM, EDII
Database: Oracle, Sybase, Informix, DB2, SQL Server, DB 400, IMS, Non-Stop SQL

Collaborative Onsite Offshore Outsourcing Model (COOM)

BFL Software has evolved through various models of working on outsourced offshore software development projects to arrive at the concept of the Collaborative Onsite Offshore Outsourcing Model (COOM). BFL Software finds that this concept facilitates a better understanding of the customers' requirements, and provides an environment where the center becomes an extension of the customers' own operations. This model best reflects BFL's mission to be *"Partners in Progress"* with their clients.

The concept involves executing projects for a specific customer with a dedicated team of engineers providing software services, exclusively for that customer. The team evolves into an extension of the customer's software development arm, in India.

This model is described below:

Organizational Structure

BFL Software recognizes that an essential element of a successful Offshore Dedicated Centre (ODC) is effective communication. The operational model, and therefore the organizational structure, is built around the need to ensure complete and distortion-free information flow.

One or more coordinators are identified both on-site and offshore, and are responsible for individual projects. The on-site coordinator (stationed at the client's site) interacts with the client and the offshore coordinator (stationed at BFL in Bangalore) for all project specific information. The offshore coordinator manages the offshore dedicated team comprising of the project leader and engineers, all usually stationed at the ODC in Bangalore.

Project Execution Model

BFL Software has evolved a unique two-phase project execution methodology for each piece of work undertaken under the COOM.

The project initiation and requirement collection is usually performed on-site. The software development plan is also usually made on-site. After this stage is complete, the design, development and testing are completed offshore.

All projects handled have clearly laid out parameters for deliverables, responsibilities, time frames and reporting. The progress of the project is closely monitored, and the project plan establishes several monitoring points where detailed reviews are undertaken. The client participates at each milestone and provides feedback, thus ensuring that communication is clear.

Continuous Process Improvement

The ODC concept helps to evolve an efficient process management methodology, which is tailor-made to suit the needs of the client. In-process analysis, carried out on an ongoing basis, paves the way for continuous process improvements, which are done based on product, process and project measures. The process can therefore be continuously modified to suit changing business needs and improve productivity/ quality.

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Case Studies

A Leading U.S.-based Computer Manufacturer

BFL Software began working with the Client after a rigorous multistage selection process that laid emphasis on technological expertise and adherence to strict quality standards. The Client required an organization that was not only competent and capable of executing the work, but could integrate seamlessly with their own project teams. The engagement started with them awarding BFL Software a pilot project, which was executed well ahead of time.

The use of BFL Software services has now been scaled up to a stage where they are one of the Client's chief software development partners outside the United States. BFL Software operates by basing a small onsite team on the Client's premises – rendering support to the offshore team in Bangalore and working closely as a facilitator for effective execution of projects. A 128 Kb dedicated link has been established with the Client in the United States to facilitate easy and fast access of information. All requests from the Client are treated as individual projects managed by identified contact points both on-site and offshore.

Today, BFL Software is viewed as a full-fledged extension of the Client's software development arm, and is meeting challenges from various departments, and divisions that are geographically diverse. This relationship is an excellent example of the robustness of BFL Software's Collaborative Onsite Offshore Model (COOM).

Offshore Dedicated Center for ING Group

ING Group (ING) is a leading Global Financial Services group and is engaged in insurance, financial services, corporate and investment banking and asset management businesses in more than 50 countries worldwide.

ING uses the Integrated System for ING Sales Support (ISIS) to automate their insurance product sales. This product, which is used in several countries, consists of two components – Head Office Management Environment (HOME) and Integrated Point of Sale Insurance System running on the laptop computers of Field Agents.

BFL Software has been chosen by ING to be a long-term software development partner. BFL Software will be working with CRISP, the company that owns IPSIS, to implement and customize the IPSIS product for various ING subsidiaries in countries across the world.

Other Sample Projects

- Development of a dynamic career portal for a large Australian Media empire, which is intending to capture a major share of online media marketing and advertisement that caters to the needs of professionals and technicians seeking exciting employment opportunities and career growth.
- Customization and implementation of an Internet-based Electronic Bill Presentment and Payment (EBPP) system for Malaysia's largest Media and Internet service group. The EBPP system is a product developed by BFL Software.

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Complete Business Solutions Inc.

Contact Information

Complete Business Solutions Inc.
32605 West Twelve Mile Road
Farmington Hills, MI 48334

Telephone: (248) 848 8810
Fax: (248) 848 1562

Partho Mukherjee
Senior Director
Email: Pmukherj@cbsinc.com

www.cbsinc.com

Company Background

CBSI was founded as a small Systems Integration private company in 1985, and in less than 15 years has grown into a US$ 462 million company offering a wide range of IT products and services in North America, Europe, Asia and Australia. In 1997 CBSI became a public company (NASDAQ: CBSI). CBSI's offshore development centers in India have achieved the SEI CMM Level 5 Maturity Rating, the highest maturity level possible. This designation, set by the Software Engineering Institute's (SEI) Capability Maturity Model (CMM)®, was conducted by an authorized assessment agency based in San Diego, California. The company has also achieved ISO9001.

Using innovative approaches, CBSI's services segment of the business grew significantly. In the late '80s, CBSI fulfilled customers' integration needs by ensuring they had the right resources on board. In the early '90s, CBSI developed program offerings in niche areas, such as Multimedia, Imaging and Object Technologies. In the late 90s, utilizing the industry expertise gained over the years and harnessing the skills available internally, CBSI formed new vertical groups to support specific industries, such as Banking & Finance, Insurance, and Retail. Similarly, the expertise gained in technology was utilized to build dedicated horizontal practice groups catering to specific services, such as Data Warehousing, ERP, CRM, E-commerce and Document Management. The industry and technology practice groups enable CBSI to provide their customers complete end-to-end services.

Complete Business Solutions Inc

- ✓ Offshore services comprise; application development, partnership sourcing – application maintenance, re-engineering, re-hosting & conversions, Web-enabling legacy systems, ERP services and e-commerce application development
- ✓ Process oriented approach and methodologies
- ✓ Strong global presence – providing local support
- ✓ Certified as CMM Level 5 – the highest maturity rating possible.

In fiscal year 1999, CBSI recorded global revenues of US$ 462 million, of which US$ 415 million was generated from business in North America. CBSI revenues grew 22.9% over the prior year. The company's offshore service revenues now account for around 6% of their total business. CBSI presently employs more than 5,200 professionals, including approximately 3,800 based in North America.

In 1997 CBSI acquired Synergy, a company specializing in AS/400 mid-range solutions. In 1998 CBSI acquired C.W. Costello and associates, a mid-sized company of 750 professionals and a nation-wide branch network. The same year also saw the acquisition of the Claremont Technology Group. In 1999 CBSI acquired Impact Solutions Group, a company specializing in Customer Relationship Management and Document Management solutions.

Main Business Activities

Over the fifteen years that CBSI has been incorporated the company has developed a number of IT products and services. The System Software products such as SIMPL and UNISAM were developed exclusively for Unisys platforms – while the company also developed tools, such as LSMART for Synon conversion, and products like APECS for Schools Administration, MOSAIC for Criminal Justice Systems Tracking and Message Plus for message switching.

CBSI has over 30 branches in the United States, grouped under three regions, and 10 branches in the rest of the world. Each branch is self sufficient in all respects, from recruitment through sales and delivery. CBSI's project deliveries are supported through seven delivery centers in the United States and three offshore delivery centers. CBSI has capacity to staff up to 2,500 consultants in these delivery centers. The two delivery centers in India are the largest, with capacities of 1500 in Chennai (Madras) and 200 in

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Bangalore. CBSI's Manila (Philippines) delivery center can seat up to 100 consultants. These capacities are expected to increase in the future.

CBSI operates under the vision of "Local Partnership, Global Delivery". They keep in touch with the customers through their local branch offices and dedicated account managers, who are also based locally. The local branches are not just responsible for account management, but also charged with co-ordination of the projects with the offshore team. CBSI uses COSMO℠, a home grown methodology, to deliver projects from their offshore delivery centers.

CBSI's industry practice groups' expertise enables CBSI to provide an IT solution that works for a broad range of organizations. Many business sectors take advantage of their IT offerings, including manufacturing, banking and finance, healthcare, insurance, public sector, retail and distribution, technology, telecommunications, and utilities. Their technology practice groups bring expertise in specific technology areas, such as Data Warehousing, E-commerce, Imaging, Document Management, CRM and Network Management. These groups assist the customers through the branches in implementing specialized solutions in their given area of expertise. CBSI also has focus groups to work on Oracle Financials, SAP and Peoplesoft, NetDynamics and Forte.

CBSI service offerings include:

- Management Consulting
- IT Consulting
- Network Engineering
- ERP
- Application Maintenance
- Maintenance Outsourcing
- e-Business
- Data Warehousing
- Object Oriented Client/Server Development
- Custom Application Development
- Re-engineering

Offshore Service Capability

Partnership Sourcing

This is a unique service offering from CBSI, whereby customers are treated as long-term partners.

CBSI entered the offshore services market in 1991. They have designed their offshore service delivery to work like an extension of the customers in-house IT department.

CBSI has invested in building good processes and methodologies. CBSI's home grown methodology for offshore is COSMO℠, while the company licensed Andersen's Method / 1™ for project management and uses RUP™ for object oriented technology projects.

CBSI is very flexible in their pricing approach. In addition to giving the customers an hourly rate, CBSI gives blended daily and monthly rates to the customers. CBSI is willing to offer fixed price projects where the scope and other boundaries are clearly defined.

Generally, CBSI encourages customers to move less interactive work offshore -- the popular offshore service offerings being:

Application Development

CBSI has delivered very large and complex development projects from their offshore delivery centers. The large projects ranged from 100 to 550 person years in effort completed within a short elapse time of 18 months. CBSI has unique robust processes that are repeatable and scalable to projects of any size. Since the parent company is based in the United States, unlike some other offshore companies, CBSI can use local talent for all on-site related work. This brings high value to the customers in terms of bringing leading edge technologies and skills for Analysis, Design and Architecture of state-of-the-art systems.

Application Maintenance

CBSI is currently maintaining large portfolios from their offshore centers. Most of the applications maintained from offshore are complex and critical to customers business needs – such applications require 24x7 support. CBSI has invested considerable time and effort in putting together a methodology that will work for a variety of platforms, and they have also built several tools for management and reporting of these projects. Moreover, CBSI invested in developing a standard four-phase methodology and trained all their project managers to support this service offering.

CBSI has also established a state-of-the-art communication network between various centers and between each country. CBSI works with customers to set appropriate 'service levels' for each application, using measurable criteria. The service levels and the metrics are periodically reviewed with customers to improve upon and provide more stringent quality services.

Re-engineering, Re-hosting and Conversions

CBSI has completed many large re-engineering and conversion projects - some totaling more than 100 person years - using offshore delivery centers. The approach and methodology used for this service offering is comparable, and in some instances better

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than, the ones used by large consulting companies. CBSI's methodology uses many standard tools to extract business logic / algorithms from the existing applications, documenting them in a user-friendly format and verifying them with the end users. If required, the process will support conducting JAD sessions to obtain any gaps in requirements that need to be filled during the re-engineering. Simple platform conversions are carried out using tools and technology that will be identified up front and built if required.

Web-Enabling Legacy Systems

CBSI is experiencing increasing demand for this service offering from offshore delivery centers. One reason for this growth is that since CBSI has been maintaining the legacy systems, the customers feel that CBSI is fully equipped to also implement this option. CBSI has established a methodology whereby the legacy front-end can be appropriately supported using the Web. CBSI's years of experience in implementing large systems, coupled with the cross-training programs in which all the mainframe consultants were provided with Web skills, gave the necessary impetus to excel in this service offering.

E-Commerce Application Development

E-commerce application development differs from routine application development in approach, with E-commerce development cycles being much shorter, requiring iterative processes and more interaction between the development teams, architects and business users. CBSI has perfected a methodology by which these requirements can be achieved with ease and precision. CBSI has completed development of complete Web sites for customers in record time, by using very large development teams. Since the key factor for success in this service offering is timing and quality, it is considered that CBSI is well positioned to do very well in this market.

ERP Services

CBSI has full service capability in offshore delivery centers for ERP. They have many functional experts supported by technical specialists making end to end services possible. Many CBSI customers have already taken advantage of these capabilities.

Case Study

UNUM Corporation

UNUM Corporation is based in Portland, ME., and is one of the industry leaders in long-and-short-term disability, long-term care, group-life, accidental death and dismemberment insurance.

Business Solution

UNUM launched "Partnership Sourcing" an outsourcing initiative for choosing the best-of-breed outsourcers for application development and maintenance and life cycle management in particular areas. UNUM was identifying select services that did not support core services and leveraging the services of certain vendors for certain skills. UNUM was looking for an approach to share responsibility that went beyond typical outsourcing. It looked for a structure that required both UNUM and the vendor to play dual but complementary management roles throughout the project. UNUM is thus able to maintain its internal organization and all its accumulated knowledge while extending its project management & resource capacity through the vendor organization.

Project Description

CBSI implemented a project infrastructure that took advantage of its offshore development center while maintaining a key group of Project Managers, Analysts and Functional people on-site at UNUM's Maine location for effective project planning, monitoring and communication purposes. The methodology incorporated a four phase approach to effectively transitioning the maintenance activity to a CBSI managed activity from a UNUM based process.

UNUM initially undertook a pilot application for maintenance outsourcing. This process ensured that both UNUM and CBSI understood both the customer and the vendor specific processes that are critical for the success of the transition. The results of the pilot project were used to streamline all of the technical and non-technical aspect of the relationship and the expectations.

The key aspect of the success was to establish a clearly defined "statement of work" that defined various factors, the skills sets required from the vendor, the measurement for evaluating the success. Even though this process was difficult, it greatly simplified the remainder of the outsourcing project.

After the pilot phase, the second phase was to successfully transition the project to CBSI on-site team. Both CBSI on-site and offshore teams participated in this process to familiarize themselves with all of the systems and the appropriate procedures required to perform successful maintenance.

The third phase, offshore transition phase, successfully established the protocol required for the smooth execution between on-site/off-shore teams and also ensured that the offshore team had the complete know-how on the applications.

Steady state, the final phase, ensures a smooth running of various maintenance activities with on-

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site/off-shore teams and UNUM working in complete synchronization and with appropriate back-up plan.

UNUM utilizes a distributed architecture to link all of their centers to a central IBM System 390. The system is written in COBOL, uses CICS as a teleprocessing monitor and DB2 as the database. The client server environment uses C++, Microsoft's transaction server, COM and DCOM.

Benefits

Selective partnering for outsourcing maintenance helped UNUM in delivering core business solutions for their internal customers in a better way and helped support the organization initiatives while substantially reducing the cost of legacy maintenance.

The GAP

The Gap is a $9.5 billion dollar fashion retailer. It operates approximately 2500 retail stores throughout the world, including Old Navy and Banana Republic. The IT organization consists of approximately 250 professionals.

Business Challenges

In the mid-90s, the company was faced with two key challenges:

- Inability of existing legacy systems to support growth and future strategic initiatives and
- Millennium (non) compliance of legacy applications.

The challenge was exacerbated by the shortage of qualified resources in the marketplace.

Business Solution

The Gap decided to implement an ERP package to address its business needs. This required not only package implementation capability on the part of the selected partner, but also the ability to integrate the package with existing legacy applications. Additionally, they wished to make all legacy applications millennium compliant.

Benefits Delivered

- Successful implementation of ERP package
- Successful conversion and integration of legacy applications
- Ongoing productivity improvements and cost reduction (through streamlined processes and offshore delivery).

Project Highlights

- Multi-platform, multi-mode delivery model
- Application maintenance, enhancement, development, conversion, implementation and integration
- Large team size and resource requirements
- Long-term partnership arrangement
- Phased approach for smooth transition
- Establishment of dedicated offshore delivery center supporting 26 systems across a variety of business processes.

Sample Customers

Customer	Industry	Service Provided	Project Details
Citibank	Banking	Application development	• Offshore application development of a Web-based Investment Needs Analysis Tool
CB Richard Ellis	Real Estate	ERP Support	• Implementation, training, and production support services for PeopleSoft's Financial and HR systems • Applications development, integration, implementation, technical, and production support services for Global Field Support, Help Desk, Client & Deal Tracking, and Property Database functions being implemented on Vantive products • Solution center in Bangalore, India, will provide maintenance and enhancement support for ERP application products provided by PeopleSoft and Vantive.
NEC, Japan	Manufacturing	Middleware customer development	• Project management support, OO methodology mentoring, OO design and implementation, C++ programming, prototyping, testing • Thin client, component based n-tier object oriented architecture • International working environment with project team members from USA, Japan, India, China and Europe • Offshore development for Design and Implementation

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E-mail: info@input.com or sales@input.com

ForSoft

Contact Information

EMEA office
ForSoft Ltd.
3 Hagalim Blvd.
P.O. Box 2062, Herzliya
Israel 46120

Telephone: (972-9) 959 8819
Fax: (972-9) 959 8844

Mr. Isaac Eldar
Vice President, Marketing
E-mail: isaac@forsoft.co.il

www.forsoft.co.il

U.S. office
ForSoft Inc.
462 Seventh Avenue, 4th floor
New York, NY 10018

Telephone: (212) 736 5870
Fax: (212) 736 9046

Mr. Roy Machnes
Managing Director
E-mail: info@forsoftinc.com

www.forsoftinc.com

Company Background

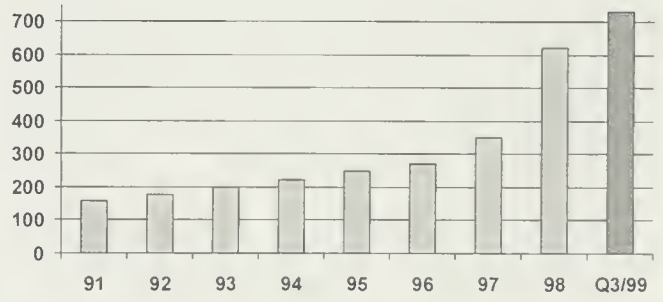
ForSoft, a public company founded in 1981, is listed on the Nasdaq (FORS). The company is 68% owned by Formula Systems – itself a Nasdaq listed company (FORTY). ForSoft is a global software and services provider, with a presence in EMEA, the United States, South America and Asia-Pacific.

In their last full fiscal year (1998) ForSoft achieved revenues of US$ 51.1 million, and in the first three-quarters of this year has recorded turnover of around US$ 47 million. The company employs over 780 software professionals – with approximately 90 based in North America - and has achieved ISO 9001 certification for their services.

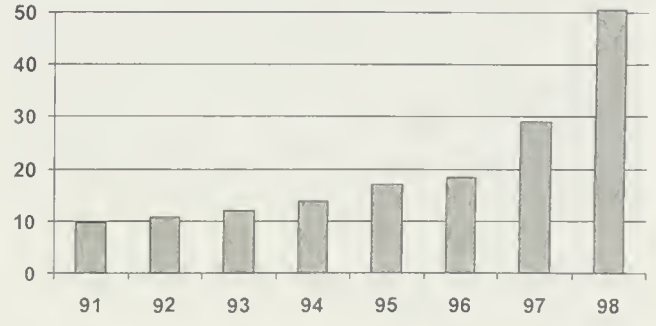
ForSoft

- ✓ ForSoft's offshore services focus is on the telecommunications industry, although they also have considerable expertise in Banking & Finance, Utilities, Transportation, Government and E-Commerce
- ✓ ForSoft is a member of the Formula group, who is ranked first by D+B in the IT Management Systems sector and is the largest public software group in Israel
- ✓ Strategic relationship with Ernst & Young Consulting and 3M
- ✓ ForSoft offers full protection of Intellectual Property Assets

Growing Number of Employees



Growing Revenues (US$M)



Heritage

In 1981 Formula Software Services (FSS) was founded by a small group of software professionals. Formula Systems was established in 1985 as a holding company, owning 100% of FSS, and is traded on the TASE and NASDAQ (FORTY). In 1997 FSS merged with ForSoft, NASDAQ (FORS), the core subsidiary of the Formula Group.

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In 1998 ForSoft fully acquired Bashan Systems, an Israeli IT services company focusing on the government ministries and corporate sector; TCS which focused on Customer Care & Billing for mobile telephony operators; A-Soft which marketed a banking solution for medium to small size banks; and Shaked Computer Systems, which is a world leader in advanced airline and travel software applications.

In early 1999 together with Ernst & Young, ForSoft created an equal partnership to implement ERP solutions, acquired Nikuv Computers that markets a financial management system solution in the Israeli market and established a U.S. subsidiary – ForSoft Inc, located in New York.

Formula Systems is the managing and holding entity for a group of companies active in Information Technology activities. All these companies, controlled by Formula Systems, are known as the Formula Group.

Formula is ranked first, by D&B, in the IT Management Systems sector and is the largest public software group in Israel. Revenues reached US$239 million for 9M 1999, with equity of over US$167 million as at 30th September 1999. Formula employs more than 3,500 software professionals (Q3/1999).

ForSoft draws, in integration projects, on resources and services from the group, delivering into the project the total capabilities of the entire Formula group.

Main Business Activities

ForSoft is the core software house of the Formula Group, focusing on the development and maintenance of applications and solutions for large organizations on common IT platforms, including open environments. ForSoft's client base consists of large organizations from Israel's top 500 organizations of major economic sectors: telecommunications, energy, banking, government, commercial, etc.

Providing solutions for large organizations have several characteristics, which ForSoft have oriented themselves to deliver:

- Complex and large systems - with a large number of geographically dispersed users
- High quality and reliable solutions is mandatory
- Constantly changing complex business procedures
- High degree of integration between the various systems
- Tailoring to unique business needs where most packages do not fit

ForSoft currently employs more than 780 professionals, among the best in Israel, and represent the company's major asset. Recruiting and training employees is a top priority task for ForSoft, enabling them to maintain the company's reputation for quality solutions - delivered on time.

ForSoft works closely with leading multi-national technology companies, and is continually seeking new cooperative opportunities, particularly in the joint development and marketing of similar and complementary products and solutions. ForSoft has a fully owned subsidiary in the United States (ForSoft Inc.). Recently ForSoft entered into a joint venture with Ernst & Young, one of the world's leading accounting, tax and consulting firms. The two companies established Ernst & Young Consulting Israel, a jointly held company that provides consulting and implementation services for leading business software products, including ERP. This joint venture brings together the experience of two outstanding operations within the IT services and consulting fields.

ForSoft's solutions for OSP Networks Planning & Design are mutually marketed with 3M: ForSoft has developed a new 3M software that enables telecommunications companies to more effectively design and manage fiber and copper telecommunications networks. 3M will market the proprietary program, as a key element in its suite of products and services for installing and maintaining outside plant networks.

ForSoft focuses on IT intensive expertise and know-how in diverse vertical markets, including:

- Telecommunications Outside Plant (OSP)
- Banking and Finance
- Utilities: Energy, Water
- Transportation: Airlines
- Government
- and E-Commerce

In the international market, ForSoft offers the following software products / services:

Telecommunications – CC&B

- CC&B Wireline & Wireless solutions.
- Consulting & professional services.

Telecommunications - OSP

- NDE: GIS and schematic based systems for the automation of planning and design of Outside Plant fiber and copper networks.

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Banking

- *BankWare*: Integrated retail core banking back office and branch automation software products.
- *e-BankWare* Internet: a complete virtual bank solution.

Financial Systems

Financial systems for corporates and telecommunications operations, which include; General Ledger, AR, AP, Bank Accounts Verification, Treasury Management System, Financial Queries & Reports, Budget Management System, Loans & Deposits, Credit Lines, Fixed Assets, Logistic Systems, Inventory, BOM, Procurement, Import/Export System, Sales Systems, and Service Systems. Also available are Manufacturing Systems (provided by Nikuv, ForSoft's subsidiary).

Electricity

Software products for supporting energy deregulated operations.

E-Commerce

E-Commerce solutions for Banking, Telecommunications, Government & Industry.

Government Sector Systems

Citizen Registration System, Passport Production System, and Elections System (provided by Nikuv, ForSoft's subsidiary).

Offshore Service Capability

ForSoft entered the offshore services market in 1999, with a multi-million dollar agreement to provide offshore services to a major telecommunications provider.

The company employs about 200 telecommunications professionals in all fields of OSS and CC&B. ForSoft's added value is in its dedication and focus on the telecommunications industry, which yields a high level of industry-specific staff and know-how. As part of the Formula Group, with its global coverage (54 countries served directly, others via partners) ForSoft is well equipped to perform software development on all levels, integration, implementation, migration, and support to the client.

A major portion of this activity is based on ForSoft's approach towards Business-to-Business services. The company is committed to providing the highest level of staff, workplans and deliverables as required by clients and their clients in turn. ForSoft takes on fixed-price projects as well as time and material arrangements, and is well equipped to support operations in different time zones, which assists its clientele in cases that a broader support window is required.

The global IT industry is undergoing a significant change. Assisted by unprecedented communication links and applications, the industry is becoming global. As software development becomes an industry like any other, manufacturing costs and efficiency, as well as backup facilities are increasingly required. ForSoft offers a unique combination of a hi-tech geographical location, a large pool of professionals, highly stable financial structure and full protection for its client's intellectual property assets.

Product Platforms

ForSoft's platform expertise comprises:

- Client-Server N-tier
- Unix
- Mainframe
- Oracle
- DB/2
- Informix
- NT / PC / LAN
- OOD / OOP

ForSoft's Strategic Positioning

The main differentiators of ForSoft in the offshore services market are as follows:

- Full protection of Intellectual Property Assets
- Highly capable experienced staff, that is intimately familiar with the business requirements of the industry - especially for Telecommunications and E-commerce
- ForSoft is result oriented, and is very pragmatic in providing solutions to their customers
- ForSoft is a stable firm, with top-rated D&B backing that allows them to grow fast and run projects on a right-scale basis, providing rapid response for high requirements.

ForSoft believes that it is imperative to achieve a win-win relationship in order to support the business logic behind offshore development. That belief is demonstrated by the true partnership they have forged with their clients.

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Sample Customers

ForSoft considers that their success is the success of their clients, who are either vendors to the global telecommunications market or carriers in the various segments of the industry: Cellular, CATV, Broadcasting, IP, and Wireline. Unless asked to do so by their clients, or in specific commercial situations, it is the company's policy not to disclose the identity of their customers. References will only be furnished on a particular basis.

The company started working for a leading Global provider of Customer Care and Billing solutions in mid-99, and managed to assist with a wide array of development and implementation support that is spread over three continents and requires an excellent understanding of the international requirements from such packages.

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HCL Infosystems

Contact Information

Infosystems (America) Inc
465 South Mathilda Avenue, Suite 102
Sunnyvale, CA 94086

Telephone: (408) 739-1700
Fax: (408) 739-1705

R. Parthasarathy
Director
Email: partha@insysa.com

www.hclinfosystems.com

Company Background

The System Engineering function was established in 1977, primarily performing software development and systems support functions for HCL customers.

In 1991, after a joint venture agreement with Hewlett Packard, the systems function was renamed as the Professional Services Organization (PSO). The scope of activities was expanded to include IT consulting, system integration and implementation of packaged software products.

HCL Infosystems, a public company, has fully owned subsidiaries in the U.S., UK, Malaysia, Singapore and Australia. The company is ISO9001 and CMM SEI Level 4 certified. HCL is a leading IT player in the Indian market, and manufactures and distributes computers, office automation and telecom solutions. In their 1999 fiscal year it is estimated that revenues of approximately US$ 220 million will be achieved, with a growth rate of almost 75% in PSO revenues on the prior year. Offshore services presently account for over 55% of total PSO revenues.

Over the past few years, HCL has experienced a large increase in business from international clients, and in response to this development they have added 50% extra capacity at their development facilities – located at Chennai, Noida (near New Delhi), Coimbatore and Calcutta. PSO manpower has also grown significantly over the past 4 years, and now employs 900 consultants.

HCL Infosystems

- ✓ Offshore service portfolio comprises; software development, Internet based development, migration consulting, workflow, SAP, and vertical application consulting
- ✓ HCL's focus on vertical segments enables them to offer value added solutions in Manufacturing, Financial Services, Telecommunications and Government
- ✓ Experience in application development covering the full development life cycle
- ✓ HCL has 4 large offshore development centers

Main Business Activities

HCL Infosystems is a leading IT company in India, offering turnkey solutions to both domestic and international customers. Their services comprise turnkey development, consulting, system integration & vertical market applications with prime focus on Web based technologies. HCL has delivered a multitude of project assignments for international clients, both offshore and on-site. Application development related projects presently account for approximately 60% of their business.

Forthcoming product/ service offerings

HCL is increasingly focused on offering advanced solutions in knowledge management / data warehousing and ebusiness - primarily application service provisioning - involving multiple types of services, as shown below:

1. Knowledge Management [KM]

KM solutions help organizations create and retain internal experience. Implementing the solution may involve several components of knowledge management.

Data warehousing covers both consulting and implementation support. Services include business requirement analysis, data modeling / mapping / migration, metadata creation, application development and OLAP services, with specialization in packaged data marts in niche business areas.

2. Application Service Provisioning (ASP)

HCL helps customers to function as Application Service Providers, hiring out application usage to their clients on a time or transaction basis. For certain products, HCL can help customize some of these applications to individual client needs. Applications could include 3rd party packaged products, as well as internally developed applications.

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Offshore Service Capability

Over the years, HCL has established and refined standard practices for software development and IT consulting projects.

HCL's portfolio of offshore services include the following:

Software development services

- *Turnkey development*: This service covers all, or part of the stages, of the development life cycle, including system study, analysis, design, construction, testing and implementation.
- *Application maintenance*: Maintaining applications developed by the customer and providing bug fixes and enhanced versions.
- *Time & material services*: Providing experienced manpower with the stipulated technical skills. The responsibility of managing the project rests with the customer.

Migration consulting

- *Application migration:* Migrating applications across hardware and software platforms.
- *Data migration:* Migrating historical and current data from the older platform to the current platform.

Internet-based development

Business-to-Business

- *Intranet:* Identify application areas, which qualify for Web-enabled access. Such applications would be used within the company, typically by staff who are geographically dispersed, and would usually run at a central computing facility. The scope may include Web-enabling applications or linking the back-end systems.
- *Supply chain integration:* Tight integration across suppliers, manufacturers and distributors involving extensible order processing, custom catalogs, pricing and payment based on customer agreements and management of merchandise. May involve Web-enabling existing applications.
- *Application integration:* Study customer requirements and develop & implement solutions, which involve the integration of customer applications with their business partners through messaging interfaces.

Business-to-Consumer

- *Non-interactive applications:* Developing applications, such as form filling, registration, call registration, time sheet, etc.
- *Electronic bill presentment:* Developing applications for electronic bill presentment with interfaces to back-end databases.
- *Portal services:* Aggregate information and simple applications to evolve business portals that integrate business processes for connecting customers, partners, suppliers and employers.
- *Shopping Mall:* Implement a solution, which enables the organization to sell their products through the Internet.

Workflow

Identification and development of workflow applications after internal business process reengineering. These applications are primarily focused on automating the internal processes of an organization. Integration of workflow applications with back-end business applications could be one of the customer requirements.

Vertical application consulting

- *Application customization:* Implementing / customizing packaged software products for selected 3rd party applications, for which HCL has trained in-house consultants. These applications include SAP, i2 (SCM), Pivotal (CRM), Saville Express (Telecom billing), EHPT billing and customer care (Telecom), LHS BSCS (Telecom billing and customer care).

SAP

- *Project management:* Managing the implementation of SAP at a customer site.
- *Functional consultancy:* Implementing and customizing selected SAP modules such as FI, MM, SD, etc., at the customer site with trained SAP functional consultants.
- *ABAP programming / reporting:* Providing additional reports and screens to customers, to support their unique requirements, which are not part of standard SAP functionality.
- *Basis administration:* Managing the server on which SAP is hosted, to provide security, improved performance and regular back-ups.
- *SAP Help Desk:* Provide support on functional aspects to end-users of SAP applications.

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HCL's Strategic Positioning

HCL's Professional Services Organization (PSO) has been offering a portfolio of solutions to domestic customers since 1977. With this extensive experience, coupled with their focus on emerging technologies, HCL believes they are well positioned to assist organizations to compete in today's tough business environment. Services are solution focused, developed with a clear understanding of the customers' business needs, and cover the complete cycle of IT Planning, Execution and Support. Resulting in true business value.

HCL's services are backed by strong quality assurance procedures and guidelines, which result in high quality end-deliverables. HCL has been awarded SEI CMM Level 4 certification and are one of the few development centers to use SPC techniques. Their robust model for software development can inherit client processes for any part of the development lifecycle.

In the area of application development, HCL has executed projects involving bespoke development, application migration and application maintenance / enhancements - thus covering almost all types of application development. Development assignments have been completed for numerous end-user companies, as well as for software product companies - who generally have extremely stringent requirements.

HCL has delivered solutions to multiple vertical segments, including telecommunications, manufacturing, financial services, utilities, and transportation, to name a few. Their mix of industry and technology consultants enables them to provide broad-based total solutions. Moreover, these varied engagements have enabled them to acquire wide-ranging domain knowledge – which is transferred to all their international projects.

With a large manpower pool of technology consultants, HCL possess skills in many platforms and can quickly gear up the appropriate resources for specific requirements. This pool of consultants is rapidly growing and kept updated by frequent training programs (on average 10 days per year per consultant) in current technology areas. HCL recognizes that trained and motivated employees are key to their success and take several proactive steps to retain them – including competitive remuneration, challenging assignments, and counseling. Moreover, their work culture encourages personal initiative – both in technology and operational areas.

Experienced Project Managers take the complete responsibility of solution delivery, freeing the customer from day-to-day involvement in project monitoring. Review procedures in place ensure that projects are completed on time and to the client's expectation.

HCL has executed projects for clients in many countries, including, the U.S., Europe, Australia, Malaysia, Singapore, Hong Kong, enabling them to understand and appreciate the differing demands and culture of international projects. HCL's global network of offices means that co-ordination support is provided locally. Depending on the client's specific needs, HCL recommend the most appropriate project delivery model and the mix of consultants who will operate out of India and on-site.

Many of HCL clients are continuous, long-term relationships – helping HCL assimilate their practices and standards and provide improving productivity as the relationship progresses. For some of their customers they run dedicated development facilities out of India. The advantage of such a relationship is that the client works with a dedicated core team and specialized consultants, who develop familiarity with the processes of the client organization, which in turn encourages quicker learning. The team can also be easily augmented or scaled back per the precise requirement.

HCL has proven experience in handling full outsourcing for software product companies, covering all areas of operations - design, development, testing, customer response center (CRC), product release for global distribution, patch operations on the Web, and providing professional services. Secure access at their development facilities ensures that the client's IPR is well protected.

A dedicated Resource Management group focuses on recruitment (from all parts of India due to the location of the development centers), enabling HCL to quickly ramp up their resource pool as required. HCL is a well regarded name in India, helping them attract talent from the industry and leading educational institutions.

Strategic Alliances

As a leading player in the domestic IT market, HCL has strong technical partnerships with market leaders such as Microsoft, Hewlett Packard, Cisco Systems, Intel, Oracle, SAP, BEA Systems, i2 and Pivotal. It also has a strong partnership with Nokia (future growth in mobile access devices is expected to be significant).

HCL is particularly strong in partnering with some of the vendors leading the way in E-Commerce, and as a result is able to assist organizations in all stages of developing and implementing strategic Web technologies.

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Sample Customers

Customer	Industry	Service Provided	Project Details
A leading US-based software company	Software products (Manufacturing)	Offshore maintenance / enhancements	Dedicated ODC for bug fixes / enhancements on MES software products on multiple platforms.
BSN Commercial Bank	Software products (Finance)	Standard product development	Development of a standard application for general ledger consolidation.
RCC, Holland	Government	Y2K remediation	Y2K remediation for payroll application covering Government employees in Holland.
Saville, Canada	Software products (Telecom)	Development of a module	Development of a module covering service provisioning that was integrated with other modules developed by Saville.

Case Study

A leading US-based software company

***Objective*:**

To take over the release of new versions / bug fixes on the Client's standard products for discrete and process manufacturing industries. This would enable the Client to focus on the development of next generation products. The Client's earlier products ran on multiple environments, which led to their development staff being overloaded with maintenance work of earlier versions. As a result, the Client was threatened by new market entrants, who could offer products based on more current technology.

***Implementation*:**

The growth of the HCL dedicated offshore facilities for the Client took place in several stages.

Firstly, a pilot project involving the migration of a non-critical module from Ingres to Oracle was given to HCL, to check their capabilities for delivery. Based on the success of this migration, bug fixes and product enhancements for one range of products was passed to HCL. Over time, the product, on various environments, was passed completely to the offshore HCL team, and subsequently, the management of another product was also given to HCL. The dedicated ODC grew from a team size of 5 to over 50 in a space of 3 years. HCL also worked with the Client in providing professional services / training at various customer sites. Today HCL participates in the development work of next generation products. When the Client sold the first product line to another firm, the new owner engaged HCL for the offshore maintenance activities.

Reason for choice of vendor:

- HCL's focus and track record on the manufacturing vertical
- HCL's ability to offer a wide range of services (consulting, development, customization, training) – and demonstrating they were capable of assisting the Client in several service areas.

Other project highlights:

The Client adopted several HCL methodologies related to application development. Similarly, HCL adopted the Client's methodologies for application release and product documentation.

One of the product lines has a wide market in the pharmaceutical industry. As part of this project was being carried out by HCL in India, the U.S. FDA stipulated that the HCL development facilities needed a quality audit. A team of developers from various U.S. pharmaceutical companies visited India to audit the methodologies / standards being used. The HCL facilities were found to be of high quality.

Over a period of time, 90% of the application maintenance work carried out by the Client's employees in the U.S. was passed to the HCL facilities in India. As HCL set up a dedicated facility for the Client, productivity increased with each subsequent project, as the initial time for familiarity with the Client processes was minimized.

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Hexaware Technologies

Contact Information

Hexaware Technologies Inc.
5 Independence Way
Princeton, NJ 08540

Telephone: (609) 951 9195 ext. 1405
Fax: (609) 951 9638

Avi Lele
President
Email: alele@hexaware.com

www.hexaware.com

Company Background

In 1994, Hexaware Technologies, a five year old systems integration/ consulting firm, was founded in Princeton, New Jersey. Hexaware is part of a larger organization - India's Hexaware Infosystems Ltd., founded in 1991. A sister company, Aptech Worldwide, with a Princeton, NJ branch, is one of the largest IT training organizations in Asia. Hexaware also has sales offices located in Chicago, Illinois, Pleasanton, California, and Montreal/Toronto, Canada. Currently, it is a privately held company, but plans are in place to be publicly listed by the end of 2000. Hexaware serves Fortune 1000 clients, with a particular focus on Financial Services, Insurance, Transportation, and Higher Education.

In 1999, Hexaware achieved SEI CMM Level 4 and has two state-of-the-art ISO 9001 certified software factories in India. These processes are strictly enforced in software development projects.

Initially starting with Y2K and Euro compliance projects, Hexaware subsequently took on many software development, re-engineering, migration, and e-business projects. Gaining experience rapidly in the legacy area, Hexaware rapidly and effectively transferred this knowledge to emerging technologies. In the past year, they have developed relationships with many leading E-Business/EAI product vendors, including Verisign, BEA Systems, IBM, Constellar, and Vitria. Other key partners include Sterling Commerce and Harbinger in EDI, as well as relationships with creative agencies assisting in providing interactive and creative services to e-commerce clients.

Hexaware Technologies

- ✓ Hexaware's service portfolio consists of: E-Business, Application Maintenance, Application Integration, EDI, Application Management, Enterprise System Management, Business Intelligence and Consulting
- ✓ Offshore methodology proven through numerous engagements with Fortune 1000 clients
- ✓ Achieved SEI CMM Level 4 in 1999 and has two state-of-the-art ISO 9001 certified software factories in India
- ✓ One of the 500 fastest-growing companies in the US, according to Deloitte & Touche.

Hexaware understands the need to provide a one-stop-shop approach for customers seeking E-Business solutions. Hexaware successfully recognized and integrated strong technical knowledge with that of other "niche" players. Hence, the successful entrance into E-Business and Enterprise Application Integration – an area demanding a great deal of knowledge of various platforms and application types.

Additionally, Hexaware has corporate experience in developing successful methodologies and, consequently, advanced further down the learning curve. Known for large-scale project management, with a reputation for on-time, within budget service delivery, clients are very impressed with the results. Having strong experience in handling a number of resources, with teams both offshore and on-site, the incorporation of partners or client resources is an easy task to manage. Hexaware adapts to client situations and is easy to work with and for. Staff turnover is below the industry average, creating a more loyal and devoted team resulting in increased service delivery consistency and reliability.

In the last fiscal year, Hexaware generated approximately 78 percent of its total revenue in North America. As a privately held organization Hexaware does not wish to disclose actual revenue figures; however, the company grew by 36 percent last year in revenue terms. Offshore revenues have grown strongly over the past couple of years and now represent about one-fifth of their total revenues. Hexaware employs nearly 600 professionals across the globe, with 185 based in North America.

Main Business Activities

Hexaware provides consulting and systems integration services from its U.S. division, which interfaces with the dedicated SBU heads, organized by technology and lines of business in India for resources, training, and documentation. Hexaware has SBUs dedicated

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to E-Business/Web Technologies, EAI, Mainframe/Legacy, AS/400 - Midrange, Application Management, and Enterprise System Management. A large group is dedicated to Quality Management.

Services from the U.S. are generally provided using the on-site/offshore model, and projects are typically quoted on a Fixed Price basis, although there can be Time & Materials components.

Hexaware's service portfolio consists of:

E-Business

- Web enabled application development
- Customization and integration of multiple packaged Web applications
- Integration of work flow and legacy systems with Web applications
- Technical testing of Web systems
- Web Maintenance and Hosting Services

Legacy System Integration

- Understand and document legacy system integration needs
- Design integration framework and architecture
- Select and program integration brokers (messaging and data transformation engines)
- Develop connectors for both standard packaged as well as legacy applications

EDI

Hexaware partners with Sterling Commerce and Harbinger to provide EDI solutions.

- EDI training and consultation services
- Information Strategy Planning (EDI Integration to Legacy Systems, Integration with ERP systems, and Selection of appropriate conversion methodologies)
- Product Evaluation, Implementation and Training
- Message Design and Mapping Support Activity
- Development of EDI-enabled applications

Enterprise Application Integration

Hexaware evaluates the business situation, designs, recommends and implements the best middleware solution. Partners include Constellar, Vitria, IBM (MQ Series) and BEA. Strong proficiency across multiple applications.

Application Management

This service is considered one of Hexaware's core strengths. Services combine design, implementation and application maintenance. Applications are being maintained for Air Canada, Princeton University, The Equitable, and TransAmerica Distribution Finance.

Services in this area comprise:

- Design and development of applications
- Re-engineering, conversions, migration, and coding
- Application Maintenance using Hexaware's proven methodologies
- Customization and implementation of packaged applications (including ERP)

Enterprise Systems Management

Services in this area include:

- Network Services
- Operating System Services (MVS, UNIX and DBAs)
- Consulting Services (Tivoli certified consultants)
- Network and security infrastructure development

Business Intelligence

Hexaware developed its own tool to facilitate data extraction, transformation, and administration. Services include Data Warehousing/Data Mart set-up and Data cleansing.

Consulting Skills

If a customer simply needs supplementary resources for projects such as those above, Hexaware can supply them. Hexaware's consultants possess a range of skills across legacy and emerging technologies (ie. Client/Server, Mainframe, AS/400, Groupware, (Lotus/Domino), Internet (tools, technologies & products)).

Offshore Service Capability

Offshore services originated with the formation of the company in 1994. Initially offshore was viewed as a means of providing lower cost, high quality resources for programming work. As the company grew, it became an integral part of the project management methodology and enhanced service offerings.

Hexaware is considered a leader in onsite/off-shore project management methodology and has a consistent record of full project delivery. As with any offshore initiative a client can expect lower costs, but clients also receive Hexaware's SEI CMM Level 4 quality and a more rapid deployment. Consultants ar employees of Hexaware, subcontracting is rare, and senior level people are assigned as Project Manager and Team Leaders. Hexaware is focused on a range of specific technologies and can provide a broad range of complementary application-oriented offering

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In E-Business certain tasks naturally lend themselves to an on-site work locale, while maintenance, connector development, design work, and development are perfectly suited for offshore. Hexaware's state-of-the-art offshore facilities contain the computing power necessary to enable work to be performed, plus the Web Technologies Group can handle the requirements. Proximity to the leading institutions in India enables Hexaware to supplement their core group at any time with top graduates. Hexaware also supplies resources for EDI from their offshore facility, where there are a number of Sterling Commerce and Harbinger trained professionals. Certain EDI related functions, such as mapping or custom programming, are usually taken offshore.

Because of the nature of Enterprise Application Integration, much of the evaluation and implementation of middleware product is primarily completed on-site.

Application Management is a service Hexaware performs primarily offshore. The development, re-engineering, and customization/enhancement of applications is well suited to their software facilities and resources. Additionally, the application maintenance service incorporates a four phase proven methodology, developed specifically for on-site/offshore project management. It delivers a detailed and precise manner of staffing and knowledge transfer. Project duties are outlined for clients per their requirements through every phase.

Enterprise Systems Management through Hexaware's offshore facilities provides a high value solution and constant monitoring, but in an environment that lowers total staff cost.

Hexaware's staff of business intelligence specialists can assist any company with data warehousing/data mart needs. They have developed a proprietary tool at their offshore facilities – which also undertakes tasks such as data cleansing and integration. Moreover, they have recently completed a successful BI project at EMI Holland, the world's largest music distributor, proving their team can assist clients at the highest level.

Hexaware's Strategic Positioning

Hexaware's main competitive differentiators are considered to be:

- High quality service is pervasive throughout the organization – from their ISO 9000 certified software factories operating at SEI CMM Level 4 to their top-notch employees.
- Technology focus and knowledge. Hexaware has anticipated and adapted to the customer's changing requirements, moving from Y2K and Euro Compliance to E-Business and Enterprise Application Integration.
- Service delivery performance. Hexaware has a strong reputation for on-time, within budget performance resulting from well-honed project management experience.
- Adding value to the customer. Hexaware prides itself on the fact that on many occasions it has added substantial value to its customers, by suggesting process changes in the interest of better efficiency of operations.

Hexaware is a complement to an in-house IT department, not a replacement. Having the proper skills to round out an in-house department is viewed as critical. Hexaware is not a management consulting firm, but has enough business knowledge to understand the drivers behind the IT initiatives and to generate the technology plans to accomplish business goals. Hexaware's main focus is on the financial services/insurance industries, with other emphasis on transportation, entertainment, and higher education.

Sample Customers

Customer	Industry	Service Provided	Project Details
The Equitable	Insurance	Y2K Compliance, Maintenance, Client/Server, re-engineering	Remediation of 1.2 million lines of COBOL for Year 2000 compliance leading to a re-engineering/conversion project. Hexaware was later awarded policyholder system maintenance. The project is in preparation for offshore transition. A pilot for a Web-Enabled Accounting System was delivered as part of a re-engineering project.
Princeton University	Higher Education	Y2K Compliance, Maintenance	17 major applications brought into compliance. Re-engineered/ converted code. Currently maintaining a mission-critical application on-site.
Trans-America Distribution Finance, IL	Financial Services	PeopleSoft maintenance	Hexaware was engaged to provide post-production support for REXNet PeopleSoft Financial applications. Hexaware provides functional enhancements, 24x7 production support, and system documentation enhancement.

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Case Study

Air Canada

With a sixty year history, Air Canada has grown from a modest operation to a Cdn. $4.9 billion corporation maintaining a fleet of 157 aircraft (excluding Air Canada's Regional fleet) serving over 545 destinations around the world. Recently, Air Canada announced an acquisition of Canadian Airlines solidifying its place as Canada's largest airline. Approximately 4 years ago, Hexaware began its Air Canada relationship with an initial Y2K compliance project.

After completing an impact assessment in 1996, Air Canada identified 26 sub-projects, covering 155 applications, running on a variety of platforms. These projects included the conversion and testing of approximately 17.5 million lines of code. Three quarters of the code was on a MVS platform, written primarily in PL1, Assembler, and Cobol. Some PC applications were written in Visual Basic, Power Builder, C++, and the antiquated Clipper. The remainder of the applications resided on a Unisys platform, primarily written in Fortran, Assembler and Mapper.

In 1997, Air Canada decided that in addition to converting systems for Y2K compliance, they would undertake full, functional testing on all mission-critical and vital applications. Hexaware was responsible for about a third of the conversion project, with ISM and the in-house staff handling the remainder. Air Canada handled test preparation, while Hexaware completed the actual testing. During the project's course, Air Canada's management enlarged the scope, increasing the team's level of responsibility. Critical systems like CRUISE and CARGO were put within Hexaware's mandate.

Hexaware was chosen as Air Canada's vendor for two important reasons: they were one of few vendors who had fully completed a Y2K conversion, and they were willing to set up a test and production environment. Hexaware began the work by implementing the global service delivery model. A secure satellite link was set-up from Air Canada to Mumbai, one of their satellite networked ISO 9000 certified software development facilities. A continuous 24/7 work cycle was created, saving Air Canada considerable time and expense. Initially, the team performed a short-term systems analysis. Once fully knowledgeable about the project scope and systems, the team was split up. Each sub-project was staffed by a project manager and senior analyst on-site, supported by a team of managers, coordinating programmers and analysts offshore. On-site managers worked closely with the client and communicated directives via conferencing to the offshore team. As Air Canada increased the project scope, Hexaware was able to meet additional resource demands due to its extensive international consultant base. Communication flow and professionalism remained constant, and flexibility was maintained.

Once the Y2K project concluded, Hexaware was then engaged to handle specific services for Air Canada's Cargo IT systems. The objective was to maintain the Cargo Application as per the performance standards specified in the Service Level Agreement (SLA), and incorporate enhancements according to the client's business needs. The Cargo Application is based on Unisys' Standard Airline System (USAS) Application Software containing several key modules. The modules automate the Cargo movement functions, messaging, advanced rating techniques, Cargo Revenue Enhancement systems and Cargo Revenue Accounting systems. Application modules were developed in FORTRAN, MAPPER, ASSEMBLER, and COBOL under DMS, RDMS and MAPPER databases.

Hexaware's mandate includes system enhancements, trouble fixing, impact analysis, conversion, testing and implementation support. Hexaware is maintaining an on-site team of 5 and an offshore team of 10.

One of the major systems enhancement projects under USAS Cargo application was a EURO compliance project. This allows the Air Canada Cargo application to accept Euro currency for business transactions and provide for Euro Accounting and MI.

Air Canada's Airline Reservation System, developed under IBM TPF (Transaction Processing Facilities) is maintained by ISM. Today as an extension of business, Hexaware joined with ISM to provide application enhancement and maintenance. The service is provided via the Onsite / Offshore Model with a Satellite link to ISM's TPF Development Center in Vancouver, B.C.

Hexaware has also developed a Cargo rate maintenance/ inquiry module. A proposal to host the system at Hexaware with a provision for Internet access to Rates by Freight Forwarders has been put forth.

Air Canada won an award and was recognized by the Canadian Government for its Y2K readiness. Hexaware is currently working on proposals to assist Air Canada with further initiatives in the emerging technologies area.

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i-flex solutions

i-flex solutions

- ✓ i-flex's range of services include: offshore turnkey software development; strategic technology and banking consulting; onsite software development; and software re-engineering
- ✓ Established centers of excellence in data warehousing, Java for Finance and CRM applications
- ✓ Ability to understand requirements of the Financial Services industry
- ✓ Proven offshore services implementation methodology and processes that aid quality delivery
- ✓ Infrastructure for supporting global roll-outs and 24x7 support

Contact Information

Citicorp Information Technology Inc.
4 Sylvan Way
Parsipanny, NJ 07054

Telephone: (201) 320 4498
Fax: (973) 644 3247

Anand Phanse
Regional Manager, U.S. and Americas
Email: anand.phanse@citicorp.com

www.iflexsolutions.com

Company Background

i-flex solutions -- a Citicorp Venture Capital Company formerly known as CITIL --is a SEI-CMM Level 5 global software provider for financial institutions. With more than 230 financial institutions as its customers in over 65 countries, i-flex has solutions for the Corporate, Retail and Investment banking segrnents using contemporary technologies like Data Warehousing and the World Wide Web. i-flex has an employee strength of over 1000 professionals, comprising consultants from the Banking and Finance Industry, technology consultants and recruits from the best Technology and Management Institutes. i-flex's total revenues in 1999 exceeded US$50 million, representing a growth rate of some 60 percent on the previous year, with approximately half of this figure being generated from business in North America.

i-flex's mission is to enable financial institutions to succeed in an e-powered world. i-flex has successfully developed a number of large and complex financial systems - both onsite and offshore. They have also executed high profile IT consulting assignments. Having worked on a diverse range of financial applications worldwide, i-flex has acquired a sound understanding of the characteristics of various local markets and the specifics of their different environments. These valuable insights into real-life situations ensure that every client is provided practical and workable solutions.

i-flex's functional expertise covers areas like foreign exchange, treasury, securities trading, portfolio management, mutual funds custodial and depository services, trust administration and derivatives trading.

Centers of Excellence

Based on their experience and with a view to offer customers a focused delivery channel, i-flex has set up the following Centers of Excellence to create value through more effective deployment of technologies.

Data warehousing Center of Excellence: Formed to capitalize on a high level of process maturity and their vast experience in conceptualization, design development and implementation. The center provides round the clock support and development assistance, as well as specialized data warehousing consultancy. The center keeps abreast of current data warehousing technologies, such as tool technology, solution development methodology and implementation processes.

Java Center for Financial Services: The Java phenomenon that began as a programming environment that embedded fancy animation applets in Web browsers has evolved into a sophisticated platform for delivering all kinds of portable and distributed applications. It continues to win new support with each passing day. Of late, banks and financial institutions have discovered the immense benefits they can derive by using Java, given the variety of application systems, hardware platforms and delivery channels - such as ATMs and Smart Cards. i-flex's Java Center for financial services was set up to exploit emerging Java technology. The Center is manned by Sun certified Java professionals comprising designers, architects and developers.

Center of Excellence for CRM applications: To help customers realize the maximum potential of their business, i-flex instituted a center of excellence for the

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customization, implementation and support of Siebel applications. The center, equipped to set up appropriate hardware, software and other help desks, utilizes the services of over 30 Siebel professionals, organized in three sub-groups; the configuration team, the deployment team and the help desk.

FLEXCUBE Information Center

FLEXCUBE Information Center is a pre-configured, ready-to-go data warehouse solution. It includes a relational OLAP processor, automated data extraction and staging tools, a pre-configured metadata repository, a user-friendly front-end with powerful reporting and analysis tools, and an Universal Metadata Manager. The FLEXCUBE Information Center can therefore be implemented quickly, simply and cost-effectively.

FLEXCUBE Information Center is application neutral. This in essence makes this product capable of working or interfacing with any operational system in use by an organization. FLEXCUBE Information Center includes an easy-to-use metadata administration tool, covering both the data model and the metadata. Modifications to FLEXCUBE Information Center configuration can be made without difficulty in accordance with changes to the enterprise IT environment or emerging information needs.

Pre-configured Business Solution Packs and reporting templates help users generate reports quickly and simply. Business Solutions can be made available for a variety of vertical industries - Financial Services, Insurance, Health Care, Telecommunications, Manufacturing, etc.

The FLEXCUBE Information Portal enables easy access to information through its powerful metadata driven information access capabilities, information search, pre-integration with third-party information delivery tools, single wired security login, personalized dash boards, key performance measures, briefing books, etc. Translating an Internet-based access paradigm to Data Warehouses.

FLEXCUBE @

FLEXCUBE @ is a next generation Internet Banking solution – which delivers the full range of Corporate, Retail and Investment banking products on the Internet – and is capable of interfacing with FLEXCUBE Retail, Corporate and Investment Banking core systems. Also, FLEXCUBE @ can interface with other back office systems to create and offer a unified Internet based delivery channel across heterogeneous back office systems.

i-flex c@fe™

i-flex's c@fe™ (Componentized Architecture for the Financial Enterprise) is an architectural framework that is specifically suited for development and deployment of state-of-the-art financial applications. It is available in the form of a set of infrastructure service layers and components with published interfaces that makes rapid deployment with any core banking system host a reality. The benefits offered by i-flex c@fe™ include:

- Seamless scalability and high availability
- Enterprise application integration with heterogeneous platforms
- Robust, flexible security
- Easy extensibility with support for business maintainable rule sets
- Support for multiple devices over multiple delivery channels
- Support for multiple languages
- A data model driven access to the physical data repository

As part of the solution, i-flex also makes available a set of tools to facilitate administration, content display configuration, set-up and maintenance of rule sets specific to business operations.

Promotr

Promotr is a multi-dimensional tool built by i-flex and used extensively in their march-to-maturity. i-flex was the first banking and financial services company in the world to be assessed at SEI-CMM Level 4 in 1995. i-flex is today a SEI-CMM Level 5 company.

Promotr addresses the entire range of information support activities in a software organization and is an optimum mix of proven processes and tools. Promotr maintains a quality database, tracks projects and measures defect rates in one desktop environment.

Promotr comprises three products - Promotr Knowledge Management (a quality database), Promotr Process Management (a project management and tracking system) and Promotr Defect Management (a defect analysis and tracking system). These fully integrated set of processes and tools, help convert islands of information in an organization to a useful decision support information warehouse on the Web.

In the context of a software development organization, Promotr delivers a tested way to help them achieve process maturity. Unlike many piecemeal tools available in the market, Promotr is not only an integrated environment, but has also evolved through experiences of a real software organization. Promotr systematically leads an organization in the path of SEI's Capability Maturity Model (CMM) from Level 1 to Level 5.

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Offshore Service Capability

i-flex, who embarked on offshore turnkey software development in 1995, is widely recognized for their comprehensive methodology – which has been proven through years of experience. Under the methodology, requirements analysis, application architecture, core design and prototype development is carried out on customer premises (on-site), while routine development work is completed offshore. The core i-flex team located at the customer site is responsible for interacting with the customer team, keeping management updated through regular reporting and reviews.

i-flex's senior professionals focus on providing strategic consultancy services, both in technology and banking. Key services include; IT strategy, system requirements, RFI / RFP, system evaluation and selection, project management, BPR, process and quality management consulting, compliance / audit, capacity planning and system integration strategy.

i-flex is also capable of formally supplying an institution with a CMM based appraisal for internal process improvement – as well as CMM training.

i-flex's services are strengthened by its technical expertise in contemporary platforms – including Oracle, Sybase, SQL Server, VC++, VB. VJ++, CGI/Perl, JavaScript, JDBC, C/C++, Power Buider, Business Objects, JavaBeans, Active-X, ASP and JDK.

Case Studies

Global Portfolio Services Re-engineering

CrossMar, a subsidiary of Citicorp based in the US, is a Service Provider for Fund Managers, Traders and Brokers worldwide. One of the services offered by CrossMar to its customers is a Global Portfolio management system for Fund Managers. CrossMar wanted to re-engineer its existing GPS system to offer enhanced features on the latest technology platforms. Flexibility, ease of use, interoperability and performance were the key goals.

Apart from support for all industry standard instruments including derivatives, the system supports real-time portfolio position keeping, price, corporate actions and rate feeds from multiple vendors, block trades, and batches feeds of securities and transactions. The system provides for interfaces to Performance, Trade and Order Management, Research, Reconciliation, and Matching systems.

The system is designed to support Service Bureau operations. While the system enables the Bureau to maintain common data for all Fund Managers at a global level, it allows a Fund Manager to selectively create his own view of the data, or create his own private data.

With the re-engineered system, CrossMar expects its customer base to grow to around 100 Fund Managers within a short time frame, each managing several billion dollars.

The system has been built on a 3-tier architecture over DCE middleware using VB6, VC++6.0, and RogueWave Class Libraries. The RDBMS is Sybase 11.5. The system was developed using Object Oriented Analysis and Design techniques. The system feeds data to FLEXCUBE Information Center, the data warehousing product from i-flex, which then renders adhoc reports over the Web.

CrossMar chose i-flex in view of its functional and technical expertise, infrastructure and capability to deliver large projects and process strengths to manage projects of this magnitude and importance. Apart from being responsible for design and development, i-flex was entrusted the task of managing this extremely complex project, with a total effort of more than 50 man-years, and involving close participation of three different organizations and four different locations spread across India and the US. i-flex has been working on the project for the past two years and is scheduled for completion in June 2000.

European Fund Administration (EFA)

EFA, a joint venture of four leading European banks, was established in Luxembourg as a specialist provider in outsourcing operations.

Experts within EFA conceived requirements for a Share Registry & Transfer Agency System. i-flex was engaged and their analysts prepared detailed functional specifications, developed and tested the system. The system was implemented by i-flex in a phased manner with each phase undergoing rigorous testing by EFA's team.

A migration tool was also developed to convert large volumes of data from legacy systems to new applications. Today EFA's Share Registry & Transfer Agency system is considered one of the industry's most advanced software solutions for this type of operation. The system developed by i-flex services the needs of over 100 product promoter groups and its open architecture will allow connection to future partner banks.

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Sample Customers

Customer	Industry	Service Provided	Project Details
Citibank - Latin American Consumer Banking Project	Banking / Finance	Regional integration and standardization of systems across Latin America In house solution provider and software development center for Citibank in Latin America	• Understanding and documenting the existing system functionality and technology • Development and implementation of a new release of the front-end system for the Venezuela bank • Design and development of enhancement / maintenance releases for the banks in Mexico, Venezuela and the International Private Banking business • Requirements study and scoping for the proposed new release to Brazil and Puerto Rico • Study on integration of existing country based development with the aim of lowering cost and leveraging all development work • Training client staff on the functionality and technical aspects to ensure they can provide support and maintain the system, while also reducing vendor dependence.
Citibank – Spain, France, Belgium, Germany and the UK	Banking / Finance	PC Internet / Home Banking	• i-flex team of more than 30 professionals with in-depth knowledge in NTDS and other related Internet-based technologies • Development of functional components for buying and selling of mutual funds; customer service contact, supplying notice for card savings account, blocking of the PIN, and order/ cancellation of TAN • SQL Server security, replication, maintenance and creation of a data access layer • Administration utility for application of business rules • Remote utility for Web Server administration
KPMG	Consulting Services	Custom Development	Partnered with KPMG to undertake development of a Security Server for Merril Lynch
Citibank, Japan	Banking	PC Internet Banking	The Internet banking solution needed to allow the bank customers to access their accounts using a standard browser, with the following functionality: • View account information and conduct transactions • Yen and MultiMoney fund transfers • Opening of time deposits in Yen and other currencies • Provide timely FX rates, FX trend information, and investment news • Cater to Japanese as well as English customers • Allow access through a variety of platforms: (Win95, Mac OS, Windows NT, MS Internet Explorer and Netscape Communicator) • Solve technical challenges in interfacing with the IBM host computer located in Singapore

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Intelligroup

Contact Information

Intelligroup, Inc.
499 Thornall Street
Edison, NJ 08837

Telephone: (732) 362 2228
Fax: (732) 362 2147

Ranjit Prithviraj
Senior Director, Offshore Services
Email: ranjitp@intelligroup.com

www.intelligroup.com

Company Background

Intelligroup was born from a need in the marketplace for experienced resources (functional and technical) in the exploding area of ERP implementation, i.e. SAP, PeopleSoft and Oracle applications. Later they developed their management consulting capabilities to offer IT strategy, package selection, BPR and change management to their customers. They now offer the full suite of IT services from management consulting to implementation to post-live support.

As the Internet grew in popularity, Intelligroup launched an Advanced Technologies practice that focused on EAI (Enterprise Application Integration), CAF (Component Architecture Framework) and the Internet. The acquisition of Network Publishing -- a Web design and hosting company -- further strengthened their Internet capabilities in the areas of Web design and hosting. Intelligroup thus evolved into a full life-cycle services provider in ERP and the Internet.

Other recent acquisitions include CPI Consulting (the first and largest Peoplesoft partner in the U.K), Azimuth Consulting (a management consulting firm in the Asia Pacific region), and Empower Solutions (a Peoplesoft implementer focused on the Public sector).

Founded in 1987, Intelligroup is a publicly traded firm (NASDAQ: ITIG) with a worldwide consultant base of over 1,800 and with revenues in excess of $186 million in 1999. Approximately US$126 million of this was generated from business in the United States. The company's offshore service activity was worth an estimated US$7 million last year. Intelligroup currently serves the following markets: the United States, the United Kingdom, Denmark, Australia, New Zealand, India, Japan, Singapore and Latin America. Intelligroup is ISO9001 certified and has achieved SEI-CMM Level 3.

Intelligroup

- ✓ Proven track record and expertise in Enterprise and e-business applications
- ✓ SEI-CMM Level 3 and ISO 9001 certified processes
- ✓ Global re-sourcing model for faster time-to-market
- ✓ Advanced Development Center in Hyderabad and shortly in Puerto Rico

Intelligroup as an ASP

Intelligroup is among the world's first global Applications Service Providers focused on helping clients enhance their business performance by implementing, optimizing, hosting, and supporting innovative e-commerce and enterprise applications.

As a leading global services firm with blazing-fast 'time-to-market', they offer one of the lowest total cost of ownership and a scalable "mass customization" business model that ensures competitive advantage no matter how rapidly you need to grow or change. Their ASP^{Plus} Solutions portfolio offers:

- Domain expertise in e-commerce and enterprise solutions, including CRM, ERP, Supply Chain, Decision Support, and more
- Full lifecycle services and support to address your business challenges
- Applications development, deployment, management and hosting.

Intelligroup's value proposition includes the far-sighted vision and methodology to help an organization compete and win in the e-World – and become *a truly Intelligent Enterprise*.

Offshore Service Capability

Intelligroup entered the Offshore services market in 1995 by setting up the Advanced Development Center in Hyderabad, India. The objective being to provide their customers with:

1. The latest technology of the highest quality and most competitive cost
2. The ability for blazing-fast time-to-market application development and deployment

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3. A "follow the sun" support model for their mission critical applications

Their service offerings are built around five core areas:

ASP^{Plus} Applications Development

- Global delivery model leverages both on-site and off-site resources, creating cost savings for their customers of up to 40-60% compared to an in-house or a traditional "on-site" consulting model
- Eliminates the need to search for, hire and keep occupied, expensive programmers in order to anticipate the peaks and troughs of development efforts

ASP^{Plus} Applications Management

- Predictable maintenance and support costs - the optimum budgeting tool
- Flexible technology framework that lets you add, change, or enhance your applications at maximum ROI - ideal for companies who must move rapidly to keep pace with new market opportunities
- Reduces the need to dedicate your in-house staff to costly support tasks

ASP^{Plus} Applications Hosting

- Per-user fee program for complete budgeting and planning control
- Offloads the entire application challenge from your in-house staff, freeing them up to do their best work on core competencies of the company
- Removes your company from the expensive and escalating hi-tech "war for talent" -- a war in which everyone is "bidding" for technical labor
- Helps you keep pace with the latest technology without having to invest in new equipment, training, or support

ASP^{Plus} e-World Solutions

Intelligroup has strategic partnerships with e-business and decision support systems vendors to create a rapid implementation solution that is cost-effective and customized to your business needs in the e-World.

myADVISOR^{TM} Application Support Portal

- Provides Web-based customer specific user support
- Three levels of advisor contact, scaled to your needs; you add users or support levels as your budget dictates
- Compared to spending hundreds of thousands of dollars developing your own support portal, Intelligroup's myADVISOR^{TM} offers a superior solution *at a fifth of the cost.*

Intelligroup's Offshore Services offers customers' an array of creative financial options: fixed bid, fixed level of effort, short term, long term pricing, risk/gain sharing, and more, offering an unprecedented freedom of choice.

Intelligroup have the following partnerships in place:

- **SAP:** Team ASAP and a Logo partner
- **PeopleSoft:** Global Alliance Partner
- **Baan:** Authorized Baan Customization (ABC) partner

In addition Intelligroup also have partnerships with the following companies/ products; Ariba, Broadvision, Oracle, Hyperion, Firepond, Seeker, Autotester and Luminate.

Offshore Advanced Development Center

A significant benefit that Intelligroup brings to the table is their offshore Advanced Development Center (ADC) in Hyderabad, India (they are establishing another offshore facility in Puerto Rico by April of this year). The ADC has in excess of 200 skilled SAP technical consultants and is equipped with the latest components in hardware and software. It operates 24 hours a day to assist clients in getting their systems up and running at the earliest. Using the ADC, according to Intelligroup, allows clients to save up to 60% on development costs alone. The ADC programming team can also be scaled almost overnight to meet client deadlines.

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Sample Customers

Customer	Industry	Business Challenge	Service Provided
Armstrong World Industries	Interior furnishings	Implementing a global SAP system quickly and efficiently	• Complete technical support during implementation
Carter Holt Harvey	Forest products	Implement a global SAP system under a tight deadline	• Delivering within deadline at a competitive price
Multinational Chemical Company, U.S.	Chemicals and Plastics	Managing peaks & troughs of SAP development work	• SAP resource team that could be called upon at short-notice • Offshore application development
TRW, U.S.	Aerospace/ Defense/ Automotive	Development of objects as part of a global SAP implementation	• Offshore SAP ABAP/4 and tool development, including data dictionary objects, reports, interfaces and transactions • Assistance in system testing
Pearson Publishing, UK	Publishing	Requirement for SAP FI-AR consultants to design functional specifications & develop interfaces using HP's IM/3 tool.	• Training of project team • Offshore application development and support
A leading manufacturer, U.S	Personal care products	Integration of their global operations using SAP R/3.	• Use of offshore development facilities to develop the reports • Resource team comprising 20 SAP programmers
A leading manufacturer, Europe	Manufacture and lease of modular building units	Requirement to outsource SAP application support functions, including functional, technical and basis areas – to a company that had knowledge of their business	• Successful support of a complex SAP environment from a combination of Onsite, Offsite and Offshore resources.

Case Studies

Armstrong World Industries, Inc.

Background

Armstrong World Industries, Inc., headquartered in Lancaster, Pennsylvania, is one of the world's largest manufacturers and marketers of interior furnishings for residential and commercial buildings. Its products range from floor coverings and acoustical ceilings to high-performance gasket materials, technical pipe and sheet insulation. In 1998, Armstrong reported combined sales of approximately $2.75 billion. Worldwide, Armstrong employs 20,400 people and operates 86 manufacturing plants in 14 countries.

The Challenge: Implement a global SAP system quickly and efficiently

Three years ago, Armstrong made a strategic decision to upgrade its disparate logistic and corporate computer systems to a unified Corporate Enterprise System (CES). The upgrade was necessary to improve global productivity and lay a uniform foundation to accommodate future growth.

The multi-million-dollar CES project covered all of Armstrong's major systems: order entry, shipping, billing, inventory, production planning, corporate financial systems, global purchasing and human resources/payroll. After thorough research, the company chose to install a SAP system. To help Armstrong implement its SAP finance and human resources/ payroll modules as well as integrate its legacy IBM mainframes into its new CES, they chose Intelligroup.

The Solution: Offshore Advanced Development Center (ADC)

"I was looking for a company that could supplement our in-house program development team," explained Steve Buswell, Manager of Technology and Development for CES. "The company also had to have a solid understanding of the SAP package. I

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learned about Intelligroup at a SAP user conference, and they've worked out perfectly."

"I toured Intelligroup's Offshore Center and was impressed," continued Buswell. "It's state-of-the art and meets all of our criteria for cost, quality and flexibility. The Intelligroup programmers that I use in India charge about one-third the rate of consultant programmers in the U.S. That's an extremely significant saving when you consider the amount of work that needs to be done. They're saving me anywhere from 50 to 60 percent on my development costs alone. And the quality couldn't be better."

Flexible staffing reduces project costs

Being very adaptable, Intelligroup can realign its offshore programming team at any time to meet client deadlines. For example, at a critical time during the project Intelligroup geared up its Offshore Center staff from five to 20 programmers in a matter of days. "Their flexibility has allowed me to keep the development part of the project right on schedule, eliminating all bottlenecks. I can always count on Intelligroup. Thanks to them, I've been able to focus my in-house resources on other projects and reduce the overall number of outside consultants. .... The cost savings and quality work are making a real difference."

Results

- Intelligroup Offshore Advanced Development Center in Hyderabad, India, cut Armstrong's development costs up to 60 percent.
- Offshore Center scaled up from five to 20 programmers to meet Armstrong deadline.
- Intelligroup provided Armstrong ISO 9001 quality programming.
- Intelligroup delivered the cost savings, quality work and flexibility Armstrong needed.
- Offshore Center programming at one-third the rate of U.S. consultant programmers.
- Intelligroup kept the development portion of the CES project on schedule.
- Offshore Center programming allowed Armstrong to focus in-house resources on other projects and reduce the overall number of outside consultants.

Carter, Holt, Harvey, Limited

Background

Carter, Holt, Harvey (CHH), Limited, headquartered in Auckland, New Zealand, is the leading producer of timber, plywood, and engineered wood products in New Zealand and Australia. With total assets of US$4.5 billion and more than 10,000 employees, CHH is one of the largest forest-products companies in the Southern Hemisphere.

Challenge: Install Global SAP System Under Tight Deadlines

CHH is a worldwide conglomerate with operations in more than 180 locations around the globe. Over the years, as it grew rapidly and acquired other companies, it also bought applications that soon caused problems in communication.

In 1996, the company decided to install a SAP R/3 system from SAP AG, with modules from finance and purchasing to production and shipping, company wide. "My module, plant maintenance, is a huge undertaking. Even though we have an internal programming team, we needed more help in order to have the system installed in all 25 of our plant locations by August 2000. Time is a critical factor in meeting our goal," stated Nick Mulcahy, team leader Plant Maintenance.

To help implement its SAP plant maintenance module CHH called on Intelligroup.

Intelligroup Solution: Delivering the "Impossible" at a Competitive Price

"We decided to go with Intelligroup because we needed extra programmers who understood SAP inside and out," continued Mulcahy, "and because Intelligroup was the most cost-effective solution. Their programmers are as good as any I've seen, and because Intelligroup has such a large pool of programmers with diverse backgrounds, they're always able to come up with a solution no matter how tough the problem. They're easy to work with and, all around, the right choice for us."

"The lead Intelligroup person quickly understood what we were trying to achieve," said Mulcahy, "and always had constructive solutions. We never heard 'No, it can't be done."

"The programming that comes out of the OADC is superb," stated Mulcahy. "Now we simply send everything through Intelligroup. Their level of service, the technical quality of their programs, and the speed that they churn out projects—it's impressive to say the least. And I can't say enough about their creative solutions and how they've managed to meet our tight deadlines."

Results

- Intelligroup's offshore Advanced Development Center (ADC) in Hyderabad, India, provided CHH with cost-effective, high-quality programs.
- Intelligroup team quickly and easily integrated with CHH team.
- Intelligroup consistently delivered creative programming solutions that others felt were impossible to do.

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E-mail: info@input.com or sales@input.com

International Informatics Solutions Inc.

Contact Information

International Informatics Solutions, Inc.
255, Old New Brunswick Road
Suite 230-S, South Tower
Piscataway, NJ 08854-3734

Telephone: (732) 981 1212
Fax: (732) 981 9040

Mr. Sudipta Gautam
President
Email: sudipta@iisinc.com

www.iisinc.com

Company Background

IIS started as a two-man company in 1989, offering offshore development services to clients in the UK. Within just ten years, IIS has grown into a software house employing 1,200 software professionals. Besides the UK operation, the company has expanded their operations to the U.S. and fourteen other countries – including South Africa, Singapore, Indonesia and Mexico. IIS is now aggressively working on enhancing its geographical outreach to newer markets in Europe and South East Asia.

Today IIS is an experienced offshore player with a fine track record – with project sizes ranging from a 12 man month project in 2 elapsed months, to a 60 man year project in 18 elapsed months across all major technologies.

IIS is a publicly owned company with a listing on the stock exchange in India. In 1997, IIS merged with the FI Group of the UK, a US$500 million company. In 1999, IIS achieved global revenues of approximately US$ 40 million, representing an annual growth rate of 67 percent. Offshore service revenues today account for slightly over half of IIS total revenues.

IIS was recognized for the quality of their work when in 1992 they became the first software house in India to receive ISO 9001 International Quality Certification from BVQI of the UK, under the TickIT scheme.

International Informatics Solutions

- ✓ Main business focus is Software Development services, Joint Product Development, Re-engineering services, Technology Change services, Maintenance services, Web-enabling/ Internet Technology services, and Euro Conversion services
- ✓ IIS was a pioneer of offshore services and is ISO9001 and TickIT certified
- ✓ IIS's core vertical competencies include Banking & Finance, Insurance, Manufacturing, Telecommunications, Utilities and Defense
- ✓ Tried and tested offshore delivery model

IIS is continually changing its product mix to reflect the rapidly changing technology and provide clients with the benefits of emerging developments, while also protecting their investment in legacy systems.

IIS Visionworks caters to the latest areas of virtual reality, multimedia, education, entertainment and the Internet. IIS Scicom carries out scientific work in the areas of geometric modeling.

Main Business Activities

IIS is amongst the top 20 Indian software houses, providing custom software development and software products to the world. In India IIS is active in the domestic market providing Intranet, Datawarehousing and Enterprise Resources Planning (ERP) solutions, in partnership with companies like Centura, Microsoft, Lotus, Cognos, SCO and IFS.

IIS' main business areas are as follows:

- Software development services
- Joint product development
- Re-engineering services (Mainframe to Open System or Client-Server)
- Technology change services (to Object Oriented, CASE, Client-Server, Visual Computing)
- Maintenance services
- Web-enabling / Internet technology services
- Euro Conversion services

IIS core vertical competencies include Banking & Finance, Insurance, Manufacturing, Telecommunications, Utilities and Defense.

IIS offers flexible delivery options to clients, including total or shared responsibility for a project, or simply providing IIS staff to augment the customer's

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resources. IIS projects can be executed at multiple locations in India and at the client site via dedicated high-speed data communication satellite links using the Software Factory Concept.

IIS has a pool of more than 1200 skilled professionals, who are capable of handling multiple platforms and technology and follow a program of continuos training on the latest developments in the IT field. IIS has an Education Division in India, with a network of 135 facilities, to cater to the ever-growing training needs of local organizations and the Indian IT industry, in general.

The emphasis on quality, the mature processes in place, and their professionals have earned IIS many repeat International customers. IIS believes in long term relationships, which are mutually beneficial.

Offshore Service Capability

IIS holds the distinction of being one of the pioneers in the field of offshore development. Offshore development services were the company's first service offering, and today remains the focus of the company. IIS was also amongst the first offshore services companies to use high-speed communication links between its development facility in India and the client-site, enabling efficient project execution.

IIS offers complete software solutions for an enterprise, covering almost all technologies. These solutions are delivered in a fashion that is most suitable for the client.

A summary of IIS' offshore services portfolio and delivery model is as follows:

Complete Software Life-Cycle Development

IIS under takes Complete Software Life-Cycle Development Projects. The Project Development stages of a typical IIS Project over a full life-cycle will normally comprise of the following stages:

- Project Initiation
- Functional Specification
- Design
- Development
- Unit Testing and Link Testing
- Acceptance and Integration Test Support

Depending on the stage at which a project is given to IIS, they take a flexible position on either following customer specified methodology and standards, or initiating IIS methodology and standards, depending on the suitability of the project and the preference of the client.

IIS follows formal, structured software development life cycle models and uses the latest structured methodologies while executing software projects. Structured System Analysis and Design Methodology (SSADM), Information Engineering, Method 1 and Commander methodologies have been used for various projects in the past. IIS has also been involved in Evolutionary Development methodologies using prototypes and 4GL tools.

Offshore Software Development

From the outset, IIS has been an offshore services provider, tackling full life-cycle development of projects. To this end, standards and procedures have been established which ensure that communications with the client are unambiguous and clear, with specific responsibilities assigned to client personnel and the IIS team. IIS has been undertaking projects on an offshore development basis for the past five years and is proud of the fact that their deliverables have been consistently meeting client expectations.

The development process usually begins on-site, involving a team of IIS analysts led by a Project Manager for the initial requirement definition and analysis phases. The detailed design and construction phases are carried out in New Delhi, with a larger project team. The acceptance testing and hand-over is again completed on-site, which also helps the customer in the implementation, installation and user education. On average, about 70% of the total effort is completed offshore in India and 30% on-site. This percentage can vary slightly depending on such factors as:

- Size of the project
- Complexity of the project – perhaps requiring more interaction
- Availability of hardware and software environments, and their cost
- Cost of development tools required for offshore development, etc.

Complete Project Management

Project Management at IIS means the effective steering of a project to a successful completion. The Project Manager carries this responsibility, but is fully backed by the line management and support functions. The key areas of Project Management activity include:

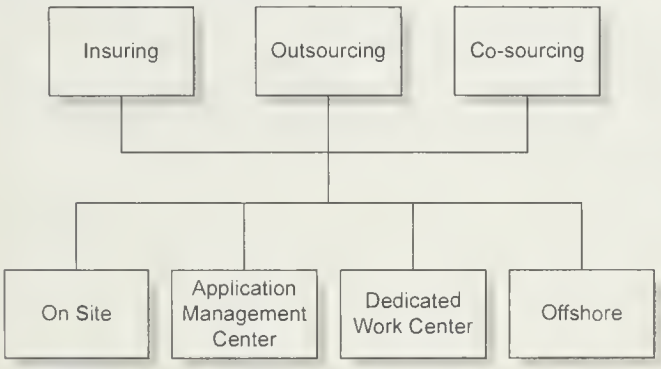
- Planning, Monitoring and Control
- Technical Management

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- People Management
- Client Management and
- Reporting.

Technical Management would include co-ordination with support functions for resources, besides Quality Control and Configuration Management. Specific activities, like Quality Control and Configuration Management, are often delegated to the next level, depending on the size and complexity of the project. The Project Manager, together with the support of the senior management team, ensures that the work, as defined in the contract or agreed in a scope of work document, is completed to the satisfaction of the client. The Project Manager is the focal point for communication with the client on all technical issues. IIS also designates one Account Manager for each project to act as a focal point for communication concerning all commercial and contractual issues.

IIS Delivery Model



Case Study

Logistics & Warehouse Company

The Client, based in the Netherlands, is a major Logistics & Warehouse company. Today the Client comprises 27 subsidiaries, located in the Netherlands, Belgium, France, Spain and Poland and has at its disposal more than 2000 trucks, about 500 high volume trucks, 450 mega-trailers, 150 trailers, 100 distribution trucks, 550 silo trucks, 250 tank trucks and 1200 containers.

The Client has 240,000 square meters of warehouse facilities and 40,000 cubic meters of silo space and several rail-service centers.

The Relationship - In 1998 IIS and the Client signed a three year relationship agreement. Under this agreement, IIS will develop and maintain their Logistics Management System and will provide ODC services to the Client.

The Requirement - The requirement of the Client was to use IT as a strategic business tool to help it shift from a traditional trucking company to a provider of complete Logistic solutions.

The Solution – By carefully studying the Client requirement, IIS was able to provide IT solutions that helped them achieve their strategic goal. Presently, IIS has successfully completed six projects for the Client, and has helped dramatically improve their Logistics Management activities.

The systems that IIS has developed to date are as follows:

Order Entry System: This Web-based application system enables the Client's customers to place shipment orders efficiently and accurately over the Internet. The system also allows the customer to be informed about the exact time that their goods will reach the destination.

Decision Support System (DSS): This system helps managers to calculate the shortest and quickest routes between any two (of 65,000) nodes in Europe. It uses the "Dijkstra algorithm" to respond to any DSS call in less that 1.5 seconds.

Itinerary System: This system deals with decisions regarding optimum path, preparation and monitoring of the shipment itinerary. The system also projects the expected time of arrival of shipments at the destination.

Image Processing System: The Image processing system allows the truck drivers to scan the Good Receipt Document at branch offices, as soon as the shipment is complete. The scanned image is compressed and sent to the head office via a frame relay network. At the head office, the image is validated and verified, and then stored - attached to the appropriate invoice. The whole process has helped the Client cut down the time taken to raise an invoice by 15 days.

Sub-Contracting: A Web-based application for third party carriers, helping them allocate and monitor their shipments.

Vehicle Cleaning System: Automates the Vehicle Cleaning Site operations, including cleaning-order acceptance, monitoring the cleaning process and handling invoicing to the customer.

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The projects currently being executed by IIS for the Client are as follows:

IMPACT System: Presentation software to simulate a customer's shipment network. In this system, efforts are taken to simulate the customer's warehouse, factory, distribution center network, as well as plotting the current shipments on the network and calculating the current cost - and optimization of cost by optimum carrier allocation.

Logistics Management System: This system allocates a shipment to the appropriate carrier, depending on preferred/ non-preferred carrier status and the prices offered by the carrier for a shipment.

Vehicle Maintenance System: Automation of the vehicle maintenance site operations.

Tender Calculation System: The system generates tenders for a shipment, which will give the optimum pricing policy.

The Skills

The projects utilize MS-SQL 6.5, C++ and VC++ and Web-based technologies. For all the projects Object Oriented Analysis under Rational Unified Process (RUP) has been used.

Sample Customers

Industry	Service Provided	Project Details
Logistics	Offshore software development services	Development of a Web-based logistics management system
Insurance	Offshore software development services	Development of a Web-based fund management system
Software	Offshore software development services & Application management	Offshore development and maintenance of a retail banking product
Information Systems	Offshore software development services	Credit Rating product customization

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E-mail: info@input.com or sales@input.com

Leverage Systems Technologies

Contact Information

U.S office
Leverage Systems Technologies, USA
2700 Cherry Avenue
Signal Hill, CA 90806

Telephone: (562) 490 0685
Fax: (562) 490 3632

Philippines office
Leverage Systems Technologies, Inc.
27th Floor, The Orient Square
26 Emerald Avenue, Pasig City
Philippines 1600

Telephone: (63-2) 631 1825
Fax: (63-2) 631 1834

Dr. Wilton Chung
President
Email: wchung@lst.com.ph

www.lst.com.ph

Company Background

Established in 1991, Leverage Systems Technologies, Inc. (LST) is now a leading system integrator in the Philippines with a customer base across the banking, telecommunications and manufacturing industries. The company's focus is providing computer software and communications networking products and services to support customers' business requirements.

LST has built partnerships with leading software, hardware, networking and consulting companies, as well as with the country's premier educational institutions.

LST has two major operating divisions - Business Solutions Division and Network Solutions Division. Each division has its own resources, including a technical support team and customer help desk.

To explore and evaluate new concepts and technologies and introduce pioneering solutions to the market, LST has also formed the Business Development Group.

Leverage Systems Technologies

- ✓ Offshore services include:
  - Application software development and maintenance
  - Quality assurance and testing
  - SAP ABAP/4 programming
  - Production support
  - Implementation services
  - Systems management services
- ✓ Industry expertise in banking/finance, telecommunications, & manufacturing
- ✓ Experience in networking and systems integration

The geographic locations served by the company are North America, the Philippines and the South East Asian region.

Offshore IT services today accounts for 30% of LST's business.

LST's Vision

"... to be the country's leading provider of integrated solutions using the best in information technology to enable customers, in the face of rapidly changing business environment, to manage their business effectively and efficiently."

The convergence of two powerful forces – advanced information technology and customer need – led LST to a business strategy that is consistent with their mission statement - to continue to offer new products and technologies in computer software, hardware, and networking. LST works with customers to leverage these technologies to gain competitive advantage.

LST values competence, performance and fairness. These values encourage the building of strong, long-term relationships with employees, customers and industry partners. The result is a cohesive team of people working toward shared goals of success.

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Software Expertise

LST is a system integrator with expertise in system development and implementation, as well as in technical support and training. Systems are developed and implemented for local and offshore projects using local technical resources with cost-effective results.

Software Products

System Management Software

LST offers system administration and management software products – tools and utilities for the mainframe and open systems environment. With these software products, businesses can improve the availability, performance, integrity and control of their network, data and applications.

Internet/Intranet Software

LST offers Internet/Intranet software to provide a total corporate network solution, including Internet firewall, Intranet security, network optimizer, Web-to-host access, to name a few.

Microsoft Certified Solutions Provider

LST is a Microsoft Certified Solutions Provider; staffed with Microsoft Certified Professionals to provide support and services for the Microsoft product range.

Software Services

Product Support

LST software engineers are highly trained on the software products they represent. The company has complete computer facilities for demonstration, technical support, maintenance, services and training.

System Integration

Based on customer requirements, LST integrates application software with communications network products, software tools and utilities and, through their business partners, computer hardware, software, data base management systems and even cabling. LST's strategic alliances allow them to deliver integrated and comprehensive solutions that will enable customers to efficiently manage their business, no matter how complex and widely dispersed the technologies.

Systems Development and Implementation

LST people have the skills to undertake the various phases of system development – from project management, analysis, design, construction and testing to quality assurance to implementation and maintenance. They have skills in both mainframe and client/server environments.

Contract Programming

LST provides contract programming services in instances when clients prefer to undertake project management, analysis and design functions.

Offshore Software Services

LST provides offshore software services, such as systems development and maintenance, systems quality assurance, functional and regression testing.

Networking Expertise

LST has expertise in network consulting, including planning, design and implementation. Technical support covers the entire spectrum from installation to repair of defective equipment. Maintenance and training for local and international organizations are provided for their installations in the Philippines.

Networking Products

LST's products address the corporate requirements in voice, data, fax and video communications.

LST has demonstration equipment for all their network products, with potential customers invited to test the products against their requirements. Customers may also use the demo equipment for hands-on training.

LST's networking products include:

- Integrated backbone packet and frame relay multiplexers for Wide Area Networks
- Intelligent networking hubs, bridge/routers and access servers for Local Area Networks
- Full-featured modems and multimedia access devices with Network Management Systems
- xDSL broadband modems that provide E1 on unconditioned copper lines and digital carrier loop systems
- Inverse multiplexers that aggregate ISDN access lines for higher bandwidths
- Digital microwave communication systems
- Spread spectrum radio systems
- Videoconferencing systems
- Predictive dialing and CTI systems
- Integrated printing systems for passenger check-in and ticketing
- POS electronic financial terminals
- Internet/Intranet security systems

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Networking Services

Network Consulting

As the distributor of a wide range of networking products and with years of experience in working with networks, LST provides first-rate network consulting services.

Specifically, they can assist with:

- Network planning
- Network design
- Network implementation
- System integration

Product Support

Clients are also assured of high-quality technical support for the products LST represents. They install all products, diagnose and solve problems and repair defective equipment.

Maintenance Services

Several international organizations, including Netrix Telcom Systems Corporation and Equant (a subsidiary of SITA), have entered into maintenance agreements with LST for their multinational accounts in the Philippines. LST is their partner in the Philippines for service and support requirements.

Training

LST trains client personnel in operating new equipment and doing first-level maintenance.

Service Units

At no cost to the client, LST provides service equipment while a client's own equipment is under repair. LST works hard to keep all their products and services at the leading edge of technology and to ensure that they are priced competitively, support open industry standards, and work effectively in customer's computing environments.

Offshore Service Capability

LST's offshore IT services had its roots in the early part of the company's existence, when placements of IT consultants were made in Southeast Asia. The network of contacts resulted in a "partnership" type relationship with ITS (now Equant). LST became Equant's local partner, and provided IT resources for the local components of its world wide maintenance contracts, as well as IT systems installation and maintenance.

The "partnership" model was key in establishing an offshore IT facility for a U.S. company when the opportunity arose in 1995. The scope and capacity of these services, along with LST's own technical expertise, has grown steadily over the years and the offshore IT facility has now become an extension of that company's IT resources.

LST's offshore service offerings include:

- Application software development and maintenance
- Quality assurance and testing
- SAP ABAP/4 programming
- Production support
- Implementation services, including:
  - Site survey, provisioning and logistics, staging and installation
- Systems management services, including:
  - Single point of contact for problem and service requirements, remote diagnostic and problem resolution, full outsourcing

LST's Strategic Positioning

LST is run by its owners – people dedicated to the company and determined to make it succeed. With the top brass calling the shots, LST claims that projects get full attention and support.

Their organization structure is lean and flat, enabling them to respond quickly to client needs and to offer very competitive pricing for products and services.

The management team is made up of seasoned professionals with years of experience in the use of information technology for various industries.

LST people, in addition to their solid academic credentials, receive high quality in-house and external training and are taught to value professionalism. LST staff are given further opportunity to develop their expertise in actual project assignments under the direction and supervision of senior technical personnel, both locally and abroad.

LST supports continuing education also for customers and partners to help them gain understanding and expert knowledge of LST's philosophy, methodologies and products.

Product specialization is practiced within the technical support teams and they are backed by their principals' support organization. No problem remains unresolved given their technical support arrangements.

LST has established a good track record, counting among their customers the Philippines' largest banks, telecommunications carriers, manufacturing companies, the government, as well as multinationals.

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Case Studies

Equant, New York

Equant N.Y. signed an agreement with a U.S. nationwide store chain for the establishment of a worldwide network and IT systems installation and maintenance. As a result of this deal, Equant decided to sub-contract part of the project to LST.

Equant was to set up Local Area Networks in the store chain worldwide offices, together with the necessary office and application systems. The LANs are an integrated part of the worldwide Wide Area Network that was also being established. In the Philippines, the client wanted to set-up a purchasing office, with less than twenty finance, administrative and purchasing staff. There were to be no experienced IT people in the office.

The IT LAN system for the Philippines office is composed of thirteen work stations with printers and other peripherals. The LAN was to be connected to the worldwide WAN of the store chain.

The services required of LST included planning and design, site survey and preparation, IT systems staging and installation, user training, and maintenance and support. Equant communicated initial system requirements, determined by the store chain, to LST. These were subsequently refined based on the local environment and requirements. The design and plan, including the budget, were finalized between LST and Equant, which LST subsequently implemented.

The IT systems were installed and are currently being maintained by LST, without any Equant personnel having to visit the Philippines. This resulted in substantial savings to Equant, and of course the end user store chain. LST not only provided the technical expertise in the IT systems staging and installation, but also the knowledge required for local implementation.

F. Corporation

F Corporation required to cut operating costs, and in particular, the budget for IT operation was to remain fixed in absolute dollar terms for the next several years. However demand for IT services continued to grow within the company. In addition, the impending Y2K conversion and testing would require more resources to be able to meet the deadline. As a consequence, the company looked offshore to gain more value for its IT budget and elected to use LST services.

To begin with the company adopted a prudent approach, rather than moving sizeable application systems and work processes to offshore. A set of selection criteria were put in place to determine the most suitable application system for offshore development, maintenance and support.

The project was timely, as the company's Y2K preparation was also just beginning. The Y2K assessment, conversion and testing for each application was then used to provide the knowledge transfer necessary to allow LST to move the application maintenance and support offshore. After an application was Y2K ready, LST continued to provide the maintenance and support, as well as production support.

The strategy remains today, even after the Y2K conversion, with LST providing the maintenance and support for an increasing number of application systems, both old and new.

Sample Customers

Customer	Industry	Services Provided
Equant, New York Equant, Japan Equant, SE Asia	Systems Integration	• IT systems staging, installation and maintenance
F. Corporation, United States	Engineering & Construction	• Y2K conversion and testing • Application systems development, maintenance and support • Application systems quality assurance • Production support

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Linc Software

Contact Information

U.S. office
Linc Software, Inc.
51, Cragwood Road, Suite 305
South Plainfield, NJ 07080

Telephone: (908) 769 9900
Fax: (908) 769 9999

David Samuel
Director – U.S. Operations
Email: david@lincsoftware.com

India office
Linc Software Services Private Limited
309/1, 1st Cross, Industrial Main Road
V Block, Koramangala
Bangalore - 560 095

Telephone: (91-80) 553 3700, 552 0890
Fax: (91-80) 553 3490

Mr. Chandra Kumar
Managing Director
Email: chandrakumar@lincsoftware.soft.net

www.lincsoftware.com

Company Background

Linc Software was founded in 1988 by professionals who had worked overseas on career assignments. For the past 12 years, the company has been clearly focused on providing AS/400 related services and support – from customization and restructuring applications – to providing total solutions.

As business partners of IBM in India, Linc Software have also developed software solutions for clients in the United States, Europe and Asia. The company has recently established a branch office in the UK; acquired their U.S.-based subsidiary and formed a relationship with a Venture Capital firm to fuel their second stage of expansion plans. Their skills span the entire spectrum of technology – from 3 and 4 GLs to Client-Server applications, through to the emerging world of Internet technology.

Exports form a major part of Linc's revenues with close to 80% of their revenues earned from overseas. Revenues from North America grew spectacularly last year, by around 250%. Offshore revenues are also a high growth area, last year accounting for around 59% of global total revenues. The company entered the Offshore IT Services business in 1991. Linc Software at present employs over 200 professionals around the globe and expects to grow to 500 in two years' time.

Linc Software

- ✓ IBM AS/400 and S/3x platform specialists
- ✓ ERP Practice: BPCS, MFG/PRO application expertise
- ✓ Strategic technology partnerships and alliances with IBM, Aspect Computing, Tango/04 and Paramis
- ✓ Key vertical competencies in manufacturing, banking, insurance, healthcare and telecommunications
- ✓ eBusiness services

Main Business Activities

Linc Software have accumulated several hundred person years of collective development experience on the IBM mid-range AS/400 and its predecessor, S/3x systems. Their team also has vast exposure to various business applications conforming to the latest development standards and methodologies.

Engagement Models

On-site Consultancy Services

Linc Software offer on-site consulting services to clients both in India and overseas. Typically, they deploy their engineers at client sites, affording an opportunity of working out of their 'natural habitat', as it were. The advantages are numerous, with close and frequent customer interaction, and a first-hand feel for the client situation, Linc Software are confident that they can meet whatever exacting standards the customer adopts.

Offshore Service Capability

In certain scenarios, the actual programming services are carried out at Linc Software's development facilities in Bangalore, India. This activity is preceded by a thorough understanding and analysis of a client's needs, and other project specifics. The entire cycle is subject to stringent quality checks, conforming to client standards. The offshore development model results in substantial savings for the client. Deliverables are possible through digital communication links, or the media of the client's choice, and are followed up with Linc's on-site implementation and support services.

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It often makes good business sense for companies to outsource their AS/400 requirements to specialist software houses. Moreover, the other benefits of using third-parties for development work is that the organization concerned can use its resources on other priority projects, while also off-loading the time consuming hassles of project management to the specialists. Clearly there is also the obvious cost advantage of engaging an offshore services company – often a fraction of the potential on-site development costs.

Offshore Development Methodology

Onsite Activities

- Project planning
- Design
- Estimation of effort
- Sign-off
- Coordination with offshore team
- Client coordination
- Project management,
- Acceptance testing & validation.

Offshore Activities

- Development
- Unit testing
- Warranty support
- Project management
- Status reporting

Connectivity Options

Through the Internet Gateway:

- Client machine connected to Internet
- Offshore team of programmers log on to the client machine
- Development is done directly on the client machine

Or, by dedicated communication link:

- Communication link between client machine and offshore development center
- Suitable for efforts involving large teams and long duration

eBusiness

Linc have expertise and resources to build full function e-business solutions for Intranet, Extranet and Internet applications on the AS/400. The development cycle includes Web-enablement and providing application interfaces.

In their attempts at shoring up the eBusiness practice, Linc has made substantial investments in people and infrastructure. A 50-strong team is already engaged and efforts are underway to establish an IBM eCompetency Center. Technologies that Linc is adept at include:

Domino and Notes: Linc possesses the requisite skill-sets to build applications on Domino that are either standalone or integrated to existing applications to provide workflow, productivity and operational benefits, knowledge management, etc.

LANSA for the Web: LANSA for the Web facilitates development and deployment of Internet or Intranet applications that securely access and update AS/400. LANSA for the Web seamlessly integrates / deploys legacy applications on the Web, besides providing an easy-to-use and versatile tool for developing new Web applications.

Java and middleware: Linc Software have a large team working on Java-based technology, and are poised to be a dominant player. Skill-sets include WebSphere, Net.Commerce and VisualAge for Java, among others.

ERP Practice

Linc Software have a fairly large pool of business specialists and software consultants who have gained domestic and overseas experience on several ERP packages, chief among them being BPCS, MFG/PRO and JDEdwards. They bring to bear a thorough understanding of business processes and have worked extensively in areas of customization, training, development of add-on modules, migration services and technical support.

BPCS (SSA): Linc Software have been involved in providing BPCS services in the areas of customization, training, development of add-on modules, migration services and technical support. Their customers tend to be medium to large enterprises, and international corporations (often standardized on a common computing environment) that need global support.

Their consultants have in-depth knowledge of AS/SET and RPG, enabling them to resolve key issues that users typically encounter with this ERP application. Linc Software's Bangalore facilities also serves as a Global Offshore Center – a hub catering to client needs worldwide.

MFG/PRO (QAD): Linc offers extended services on their ERP product that includes, customization, implementation and training. The team at Linc has had extensive exposure to Progress, a 4GL on which this ERP is built, leading to efforts that have culminated in major customizations and building of add-on modules that are unique to a given region. For instance, Excise Duty, Export Documentation and Payroll.

MFG/PRO is an ideal solution for mid-sized organizations – with QAD offering a variety of supply chain and enterprise resource planning (ERP)

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software products to manufacturers within the automotive, consumer products, electronics, food and beverage, industrial products and medical sectors. It supports multiple currencies, including the Euro, and is configurable, interoperable, and open to best-of-breed components. It uses either Oracle or Progress databases, and runs in UNIX, Windows, and Windows NT environments.

JDEdwards: Linc have serviced clients running this ERP and have customized, carried out enhancements and developed bolt-on modules.

LANSA

Linc offers a range of services on LANSA, including sales and support, training, application development and customization. LANSA is an integrated family of highly productive design, development and maintenance products for multi-platform host and network applications. It is one of the leading cross-platform application development environments, enabling the rapid creation of new applications.

Linc Software has the ability to leverage their technical expertise on LANSA – a toolset for advanced application development across environments - by virtue of being Aspect Computing's sole distributor in India, and it being their preferred development environment.

Their world-class expertise in this area allows them to deploy robust, industrial strength applications within very short timeframes. There's virtually no learning curve and clients have the benefit of having consultants who are productive from day one - resulting in tremendous savings for clients.

Visual LANSA: Visual LANSA is an application development tool for the Windows platform with GUI interface. Developing applications using Visual LANSA is much more productive with the component technology compared to any other front-end tools and can be ported to other platforms without any change of source code.

Software Restructuring

Migrations & Conversions: Linc Software have worked with a number of organizations with applications running on IBM mid-range machines, such as the S/3x, who needed to transition from old technology (32 bit CISC) to the new (64 bit RISC).

Linc's restructuring capabilities involve conversions and providing a multi-lingual facility. They have been instrumental in re-designing the EoD processing to include multi-processing (concurrent), converting RPG II and RPG/400 code to ILE RPG.

Development of common routines and introducing remote print capabilities are part of a typical restructuring exercise. Developing tools and providing data migration services complement the restructuring activity.

AS/400 Programming Services

Linc are in the fairly unique position of being able to harness wide-ranging technology skills on the AS/400 and other major platforms, including development of world-class solutions, restructuring applications, their maintenance and eBusiness.

In India, Linc are business partners with IBM India and IBM Global Services, and collaborate with them on software development and implementation projects, both for Indian and overseas clients.

Development: Linc Software has a large pool of software consultants who have worked on Client Server environments, RPG, COBOL/400 and more recently, Java, at several client sites home and abroad. The majority of work in this area is for modifications, enhancements and new development.

Linc customers in this area are generally medium to large enterprises, representing virtually all industry sectors. Many of their clients are multinational corporations who operate on heterogeneous environments and need global support. Customers also include other software houses that have applications based on RPG on the AS/400.

Maintenance: Linc Software have over the years been maintaining core and legacy applications for clients across the industry segments that they are focused on. Effort typically calls for 24x7 support, resolving bugs and glitches that arise on a day-to-day basis.

Euro: Linc began focusing on the Euro in earnest in January 1999 and since then have built enough competencies to address all Euro-related issues.

Case Study

A major in the flavors and fragrances industry

A market leader in their industry, headquartered in Geneva, using BPCS for Finance, Manufacturing and Supply Chain operations.

Linc Software has served as their offshore Design and Development Center since February, 1999.

Objective

- To assist in the implementation and customization of BPCS V6.0.04, in the areas of Manufacturing, Supply Chain and Financials.

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- To provide BPCS go-live support
- To provide feasible and efficient offshore support and Change Request execution
- To provide complete management and execution from technical design writing to quality testing
- To centralize development activity for better quality, efficiency and management
- To cut implementation cost

Implementation

The Project was divided into 3 phases:

Phase I: A two month pilot project with Linc professionals working offshore. Work mainly entailed development and co-ordination was through e-mail

Phase II: After the successful pilot, a six month on-site / offshore phase with Linc professionals based on-site and offshore. On-site work mainly entailed technical design, on-site go-live support and quality testing.

Phase III: The complete offshore phase with 10 Linc professionals working online to the AS/400 based in Geneva. Work mainly entailed technical design, development, unit and integration quality testing.

The primary tool used for development was AS/SET.

Implementation of the offshore project comprised:

- Formation of an offshore team, comprising of a Project Leader, Analysts and Developers
- Training of the offshore team in client methodology and quality standards
- Establishing communication links with the AS/400 and Intranet connectivity to Geneva

Reasons for selecting Linc

- Recognized as AS/400 specialists
- Experience in several BPCS customization projects
- Excellent customer recommendations

Deliverables

- Offshore Technical Design services on core BPCS modules of Supply Chain and Manufacturing
- Euro project performed offshore
- Above 95% on-time delivery. Any delays were caused by re-scheduling of priority assignments or communication outages
- Use of Delphi's Wideband Technique for accurate estimations
- 97% of estimates approved (i.e. only a 3% rejection)
- Estimates and quality of deliverables constantly improved based on experience matrix
- Adaptation and improvement of clients methodology and quality standards
- Low re-work due to high quality of deliverables
- High level of security of client systems and documents.

Sample Customers

Customer	Industry	Service Provided	Project Details
Sonus Inc., United States	Healthcare	Offshore application development	• Automation of insurance claim processing and settlement o individual claims • Linc connected to Sonus' AS/400 system through the Interr • Application built on LANSA
Bank of Nova Scotia, Canada	Banking	Application restructuring services	• Project in association with IBM India • Restructuring of Caribbean Automation Program (CAP), a retail banking application, to a native AS/400 environment • Integration of CAP with other applications, supports increase business volume, consolidates multiple countries with one data center, and enhances the functionality of the applicati
RTC, United States	Financial Services	Offshore application development	• Re-write of the Net.data site, using LANSA for the Web • Existing functions, such as Client Account Information, Ass Information, Current Quarterly Cash Report and Distributio Reports and the databases were re-written to enable viewi of all details via the Internet.
Imperial Chemical Industries, UK (through CSC, UK)	Process Manufacturing	BPCS Y2K offshore conversion services	• Impact analysis • Conversion of code for CL and AS/SET programs • 13 member offshore team connected to ICI system through 64kbps lines. • 7 member on-site team for project co-ordination activities

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Mahindra Consulting

Contact Information

Mahindra Applied Systems Technology Limited
33, Wood Avenue South, Suite 600
Iselin, NJ 08830

Telephone: (732) 603 3522
Fax: (732) 603 4987

Mr. Vic Kale
Marketing Manager
Email: mahindra.consulting@prodigy.net

www.mahindraconsulting.com

Company Background

Mahindra Consulting is a 100% subsidiary of Mahindra & Mahindra Ltd., which is the flagship company of the Mahindra group. The group's annual sales turnover exceeds US$ 1.5 billion derived from a varied business portfolio. The Mahindra group ranks among the leading industrial houses in India.

Mahindra Applied Systems Technology Limited, known by its trade name Mahindra Consulting, is an international software services organization specializing in software development for a complete range of business and manufacturing applications. Mahindra Consulting has over 220 software professionals with expertise in SAP (ABAP, BASIS, Functional), Internet / E-commerce applications development, Client-Server application development and IT Facilities Management services. The company plans to expand its software team at the rate of 50 percent per annum for the next 3 years to ensure that it is able to meet the fast growing requirements of its customers, both in India and abroad.

Mahindra Consulting is committed to be one of the leading Indian IT consulting organizations in the global market, recognized for providing state-of-the-art, innovative and high quality **Enterprise Management Solutions**. Enterprise Management Solutions include implementation services for leading ERP, CRM, SCM and PDM software products, development of Internet / E-commerce / Client- Server solutions and Enterprise Application Integration (EAI) solutions.

Mahindra Consulting

- ✓ Full complement of SAP Services – including Functional, ABAP and BASIS
- ✓ Internet / E-Commerce and Client-Server application development
- ✓ Software products development; Interfaces development and testing
- ✓ Enterprise Management Solutions & IT Facilities Management Services

The company has established the following alliance partnerships:

- National Implementation Partner of SAP
- Microsoft Certified Solutions Provider
- Implementation Partner for Unicenter TNG, a product of Computer Associates

Mahindra Consulting is also in the process of finalizing partnerships with leading global vendors in the fields of Customer Relationship Management and Supply Chain Management.

Main Business Activities

Mahindra Consulting provides offshore and onsite services in the following areas:

SAP services

SAP Pre-Implementation Services

- IT infrastructure planning & implementation
- Network design & implementation

SAP Implementation Services

- Functional consulting
- ABAP / SAP script programming & BASIS support
- Development of add-on applications / extensions to SAP
- SAP interfacing solutions (ALE, BAPI)
- Professional services

Post SAP-Implementation Services

- SAP Computer Center Management
- IT Facilities Management (Helpdesk, Desktop, LAN, WAN Management; Environment: NT, Exchange, CA-Unicenter, SAP)

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Internet / E-commerce solutions development

- Application development
- Application integration with Enterprise systems
- Web-enabling of legacy systems
- Web-based software products development

Client-Server solutions

- Application development
- Migration & porting of applications
- Software products development

Training

- Functional, Technical & End-user

Offshore Service Capability

Mahindra Consulting has a very focused consulting operation with specialization in SAP services, Internet / E-commerce solutions and Client-Server solutions. Their focus and experience over the years has helped them in developing high degree of competencies in these chosen areas of specialization. They have executed several offshore and off-site projects for their clients and have a well-tested methodology for successful execution of these projects. Some of the offshore projects executed by Mahindra Consulting include:

SAP Extensions / Add-ons (ABAP & SAP Script)

Mahindra Consulting specializes in developing add-ons / extensions to SAP to meet specific user requirements which cannot be met by standard SAP software. They have developed several SAP add-ons / extensions for processes like Goods Rejection, Invoice Verification, Amendment of Purchase Orders, Capital Goods Procurement, Physical Inventory Verification etc.

The main features of the above components are that these are integrated with standard SAP transactions. The transactions are made highly productive by using SAP enhancement techniques without modifying the Standard SAP code. Also using the add-ons, a lot more control is introduced into the transactions. All such SAP add-ons / extensions developed by them have the same look and feel as that of the standard SAP system, which makes them easy to use for the users.

Typically, the specifications for the SAP extensions are developed and validated on-site by Mahindra consulting, who work in close co-operation with the client. The consultants carry the specifications back to Mahindra's competency center in Mumbai – where the SAP extensions are developed and tested against the client specifications. After the testing phase, Mahindra Consulting implements the modules at the client site.

Mahindra Consulting's ABAP Development Center is staffed with over 50 consultants – all ABAP and SAP script development specialists. The center also houses professionals with expertise in interfacing technologies. In fact, they have developed Web-based SAPbridge software to integrate non-SAP applications with SAP.

Internet / E-commerce solutions

Mahindra Consulting has developed several applications for clients in the area of Internet / E-commerce. Some of the solutions include:

- **eShoppingMall**

Developed for the online purchase of goods for one of their major customers, the solution featured online registration, shopping basket functionality, payment using Microsoft Wallet, an email facility to the customer confirming the order and interface with an existing inventory and financial accounting system.

- **Dealer Web Site**

An Extranet was established to serve the customer's dealer network, with the key objectives being to improve the speed and efficiency of interaction with the dealer community. The Extranet site was designed to contain the Dealer & Stockist Directory, Sales Order Application, Training Schedule, Spare Parts Catalog and Ordering System.

- **ePartsCatalog**

A Parts Catalog system was developed for its customer in the automotive industry. The solution developed by Mahindra Consulting featured all the components required to build and edit the catalog, as well as providing an ordering facility over the Web.

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5 Step COSTsaver Offshore Methodology

Phase III – Study

(Offshore Phase)

Study of project description document(s) & software (if any), at the competency center in India. (No Fees)

Phase II – First Level Scope & Project Plan

(Offshore Phase)

Preparation of first-level scope of work, project plan and cost-estimates, at the competency center in India, prior to project proposal approval by customer. (No Fees)

Phase III – Detailed Project Plan & Specifications

(Offshore or Onsite Phase: depending on the project size)

Preparation of detailed scope of work, project plan, standards, milestones, deliverables, review & sign-off procedures, system specifications, program specifications, test plan and cost-estimates.

Phase IV – Development & Testing

(Offshore Phase)

Development, Testing, Documentation, Despatch of deliverables as per schedule, Review, Feedback, Sign-offs.

Phase V – Integration / Acceptance Testing

(Offshore or Onsite Phase: depending on the project size)

Integration / Acceptance testing, Delivery of tested software, Documentation, Training, Sign-offs.

Mahindra's Strategic Positioning

Mahindra Consulting is a very focused organization with a high degree of expertise in the areas of its specialization. They are committed to provide offshore services to their client organizations in the United States and Europe, and they firmly believe that there is real benefit from offshore services from India, as opposed to on-site services. Their key competitive differentiators are considered as follows:

High level of expertise and experience in their areas of specialization

Mahindra Consulting has over 220 full-time software consultants, with extensive experience in SAP (Functional, ABAP & BASIS), Internet / E-commerce and Client-Server application development. Almost 70 percent of their consultants have been certified by SAP, Microsoft and Computer Associates for proficiency in their respective areas of specialization. Mahindra Consulting places high value on hands-on experience and the vast majority of their professionals have been involved in several projects.

Well-defined Offshore / Offsite Development Methodology

Mahindra Consulting has a well-defined offshore/ off-site development methodology, that helps them execute projects with precision, consistency, quality and well within the defined time period. The experience gathered over the years through numerous offshore projects has helped them in defining various templates and procedures, which have become instrumental to their success. These templates and procedures cover the entire project life-cycle, including templates for defining user requirements, system specifications, program specification, programming, code review, test plan and user acceptance testing.

Mahindra Consulting runs a centralized development center in Bombay for their customers. The services offered include programming of components using ABAP/4 and SAP script, SAP-to-Non-SAP application integration, help desk support as well as remote BASIS support. The experience and competency gained through implementing a centralized development center has helped them to extend this service to other customers.

Remote BASIS support includes activities like System Monitoring, Back ups, Authorization Management, Database Management, Front-end Management, Transport Management, User Administration, Performance Tuning, Workload Balancing, Printer Management etc.

The salient features and benefits of Mahindra Consulting's offshore development methodology are considered as follows:

- An option of executing the projects on Fixed-Price or Time & Material basis.
- Drastic reduction in customer's project costs, by as much as 50% of onsite project costs.
- Customer is kept updated, as per a pre-defined schedule, on progress of each project and is also sent an intermediate-deliverable in order to obtain his feedback.
- Outsourcing of the offshore / off-site projects to Mahindra Consulting help customer's software development team focus on other projects that are not suitable for outsourcing.

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Sample Customers

Customer	Industry	Service Provided	Project Details
M & M Ltd.	Manufacturing	Full SAP implementation & off-site software development	• Implemented SAP at 8 sites • Providing comprehensive post-implementation support for the past 3 years • Developed several add-ons using ABAP / SAPscript • Developed various Internet / E-commerce / Client-Server applications
Synchron, Germany	Software Consulting	Offshore software development	• ABAP development
ABB	Engineering	Off-site software development	• ABAP & SAP script development
An Education Management Systems Company, USA	Education	Offshore software development	• Integration of Education Management System software package with SAP

Case Study

M & M Ltd

Web-based SEAMLESS System – Bridge to SAP

The SEAMLESS system was developed for M & M Ltd., one of the leading industrial houses in India and a major manufacturer of utility vehicles and tractors.

Objective

Mahindra Consulting's assignment was to design, develop and provide a bridge between SAP (implemented at M&M's corporate office) and legacy systems, which are used at area sales offices or dealer/retail outlets. All systems were to be integrated with the central SAP system. M&M Ltd has over 35 area offices and around 500 dealers.

Implementation

The SEAMLESS system provides the solution for integrating the sales & distribution network, with the corporate HQ. This is achieved by transferring the necessary data to and from the corporate HQ, area sales offices and dealer/retail outlets and vice versa by using an Internet technology based solution.

Reason for choice of vendor

Mahindra Consulting was considered ahead of other vendors because of its expertise in the development of Web-based solutions, as well as its prior experience with integration of SAP with non-SAP applications.

Innovative offerings

With the use of the SEAMLESS system, the integration of the SAP & non-SAP systems was achieved in an efficient and cost effective way for the following reasons:

- Low network set-up cost
- Elimination of manual supervision
- Low transmission cost
- Scalability across the enterprise
- Elimination of the requirement of SAP user licenses for area / dealer offices

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Majesco Software, Inc.

Contact Information

Majesco Software, Inc.
4699 Old Ironsides Drive, Suite 350
Santa Clara, CA 95054

Telephone: (408) 588 7011
Fax: (408) 980 1255

Mathew Augustine
Director of Marketing
Email: info@majesco.com

www.majesco.com

Company Background

Majesco is the U.S. subsidiary of a global software services company, Mastek Ltd., headquartered in Mumbai, India. Mastek employs ISO 9001 and SEI CMM Level 4 certified methodologies to execute software development, maintenance and enhancement engagements at their facilities in Mumbai, India, reducing risk and delivering higher throughput for clients worldwide.

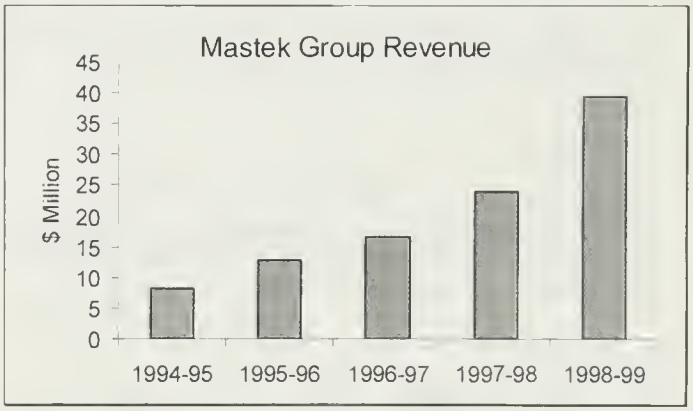
Mastek was established in 1982 in India. Over the next 7 years, they grew rapidly to become one of the top five local software companies. In 1989, operations began in Singapore, and in 1992, the U.S. subsidiary was established. The UK subsidiary followed in 1993. In 1999 Mastek set up its German subsidiary and a branch in Japan. Today, Mastek has over 1,000 employees deployed in 15 offices around the world.

With an IPO in 1992, Mastek became one of the first software services companies in India to go public. Today, Mastek's market capitalization stands at over US$ 750 million.

Mastek provides software services to a global customer base, using a local subsidiary model. Local executives who understand and empathize with their respective customer's problems and challenges manage the subsidiaries. Each subsidiary takes ownership for delivery of services using a cost-effective combination of onsite, offsite and offshore teams.

Majesco Software

- ✓ Focus on the Front Office, CRM and e-Business applications – such as Siebel, Clarify, Vantive, Silknet, Vignette, etc.
- ✓ Creative new development / application management methods integrating RAD with waterfall methodologies, especially suitable for leveraging the offshore development model for Internet and client/server applications.
- ✓ Integration of legacy, back-end, applications with new, front-end applications
- ✓ Local-Global governance structure
- ✓ Development Centers with SEI CMM Level 4 and ISO 9001 certification.



Majesco has access to Mastek's 1,000 employees and facilities located worldwide. With this, Majesco offers their clients the strength and resource scalability of a large organization, with the agility and flexibility of a small one.



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Main Business Activities

Software Application Development in the "Front Office" (e-CRM/CRM/e-business) area is one of the fastest growing areas today, and represents Majesco's main area of focus and expertise.

Majesco's Front Office applications expertise includes:

- CRM Applications – Sales, Marketing and Service Automation – these include customer interaction, as well as internal applications that support sales, marketing and service
- E-business applications – Business-to-Business and Business-to-Consumer applications
- Data integration, data mining, and data analysis applications
- Integration of legacy, back-end, applications with new, front-end applications

There are three 'waves' in the life cycle of front-office applications, which often require services from experts.

First Wave

Implementation: CRM software is implemented – including installation, customization, and configuration. The first wave usually focuses on the sales and service area. Interfaces for customer interaction such as CTI, e-mail, Fax, and Web are also developed at this stage.

Second Wave

Integration: Data integration and data analysis is undertaken, with emphasis on legacy applications and data. The second wave sees the creation of data warehouses and data marts, as well as the creation of vertical, specialized "*bolt-ons*". Marketing automation, including campaign management, is completed within this stage, as is the integration of all customer interaction – Web, phone, e-mail, fax, etc.

Third Wave

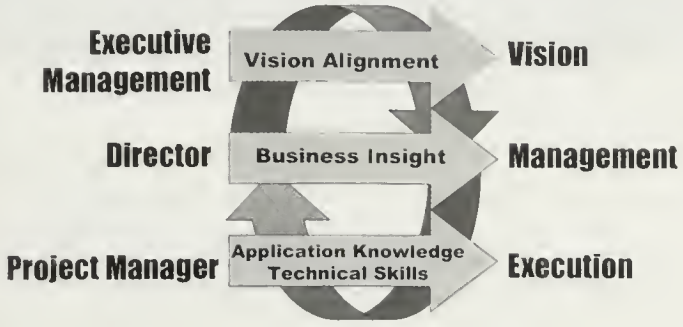
Management: The third wave includes enhancements, add-on development, content management (catalog updates, data base maintenance), integration with back-office operations, ERP systems, legacy applications and updates/changes to legacy and back office systems.

The applications that lie just 'below' the front office applications usually have to be maintained and modified regularly. As "front office" led engagements move to phase 2 and 3, there will be the need for more back office/operations integration, leading to Continuous Maintenance and Enhancement (CME) type engagements for these applications.

Stage of the Application	What Majesco Offers
Implementation	• Complete project ownership, fixed price, or T&M • Staff augmentation of project teams
Integration	• Prime service provider, project ownership • Long term, flexible capacity
Development and Deployment	• Prime service provider, project ownership • Long term, flexible capacity • 24-hour development cycle using offshore-onsite combination teams
Management and Support	• Application Management Outsourcing • Long term, flexible capacity • Variable team sizes that ramp up and down based on requirements using offshore-onsite combination teams

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Three Tier Engagement Model



To relieve the client of the responsibility for risk management, Majesco uses a three-tier engagement model to continuously align the organization's vision to the management and execution of the engagement. The U.S.-based management and core technical team bring together the onsite and offshore resources and take ownership and accountability for the success of the engagement.

Offshore Service Capability

Majesco has been providing offshore services for the last sixteen years. They have evolved their processes beyond the traditional legacy system maintenance – the long-term staple of offshore service companies – to meet the challenges before the IT organization of today. Majesco believes that more than just good infrastructure and processes of offshore engagements are required to meet today's organizational goals.

Majesco understands this and works with their clients to a third generation model of offshore application management. There are four elements in a successful third generation engagement:

1. Three-tier communication to align vision, management, and execution.
2. Phased plan for transitioning to a "steady state" offshore engagement.
3. Metrics and measures specific to each phase of the engagement.
4. Customizable support processes to meet different engagement objectives.

Local Force, Global Resource

Majesco leverages their global capabilities and experience to guarantee a scalable resource capacity, and their customer intimacy – emphasized by the strong local presence – ensures this meets the client's specific requirements. The collaboration strategy continually aligns the Vision, Management, and Execution of the engagement.

Offshore Service Offerings

Majesco's focus is on client/server and Internet applications in the front-office and e-Business application areas. They also provide interface, integration, and migration of legacy applications and data. Specifically, service offerings are as follows:

Application Maintenance Services

- .x release for software companies and dot com companies
- structured regression and integration testing
- performance improvements

Ongoing Production Support

- global 24x7 support – and a 'follow the sun' approach to staffing teams
- variable team sizes that ramp up and down based on requirements

Application Enhancement Services

- Ver 0.6 developed on RAD, primarily onsite, ver 1.0 or ver 1.5 using offshore teams
- Enhancements using RAD/waterfall and onsite/offshore combination

Majesco's Strategic Positioning

The key strengths of Majesco's offshore services are considered to include:

- Customer intimacy emphasized by the strong local presence and easy escalation processes
- Tools such as the Automated Request Tracking System (ARTS) and a three-tier model of engagement to proactively confront customers with issues.
- Exclusive focus on client/server application management, and leading-edge expertise in Web technology
- Creative new development / application management methods integrating RAD with waterfall methodologies.
- Focus on the Front Office, CRM and e-Business applications, with the majority of technical staff trained and experienced on the latest front office and eBusiness tools, such as Siebel, Clarify, Vantive, Silknet, Vignette, etc.

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Sample Customers

Customer	Industry	Service Provided	Project Details
Sea-Land Service	Transportation	24x7 support & production support	• Shipment management and terminal automation systems
AT&T	Telecom	Application development & enhancement	• CRM system using Siebel, interfacing with a variety of back-end, middle-ware and reporting tools and environments • 40+ people onsite and 60+ offshore.
Academy	Software company in the public sector in the UK	Ongoing maintenance & enhancements	• Analysts based onsite • Execution of maintenance and enhancements offshore
Lexx	Logistics/Service	Application development	• Crash Phase I development to meet time-to-market challenge. Ramp up of 0 to 20 people in two weeks.
Engagetech	Dotcom software company	.x releases	• Pure offshore engagement. Offshore team responds to requirements from client for execution of .x releases of multiple products using bleeding-edge technologies.

Case Study

Sea-Land Service

Objective

To improve overall service levels (service turnaround of requests, system performance), at the same or lower cost.

Implementation

Majesco provided two development teams, one on-site and one offshore. The on-site team had the responsibility of solving all short-term problems, such as technology and application knowledge transfer to Majesco, resolving all immediate, critical production problems, and re-engineering certain development processes to facilitate offshore Continuous Maintenance and Enhancement (CME). The offshore team was responsible for establishing mid-to-long term development processes to match the customer's method of development and deployment of the application.

Reason for choosing Majesco

- The value of 'customer intimacy' demonstrated by Majesco
- Majesco's strong local presence
- Majesco's demonstration of the ability to understand the business-technology interface of the system

Innovative offerings

- Majesco's transition management methodology
- The integration of RAD and waterfall methods of development, planned releases vs. patched releases.

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Onward Technologies

Contact Information

U.S office
Onward Technologies Inc.
30300 Telegraph Road, Suite 120
Bingham Farms, MI 48025

Telephone: (248) 593 1436
Fax: (248) 593 1439

India office
Onward Technologies Ltd.
Unit 152, SDF-V, SEEPZ, Andheri East
Mumbai - 400 096

Telephone: (91-22) 829 2903
Fax: (91-22) 829 2376

Ajit Chaphalkar
Chief Operating Officer
Email: ajit_chaphalkar@onwardgroup.com

www.onwardgroup.com

Company Background

Onward Technologies Inc., commenced its U.S. operations in 1998 in order to provide professional services and consulting to its clients in North America. The focus of its operations is to provide knowledge-based, software driven professional services and consulting through a blended model of *'offshore'* projects coupled with *'on-site'* services. Onward Technologies Inc., is a wholly owned subsidiary of Onward Technologies Ltd. India, a public limited company, listed and traded on all the major Indian stock exchanges.

The Onward group of companies was founded in India on 1st August, 1991. Today, Onward Technologies services a large base of over 2,500 customers in India and overseas. Onward's total revenues had grown to US$10 million by 1998, with approximately US$14 million expected in 1999.

In 1998 US$2.2 million was generated from the U.S. market, with close to US$4 million forecast for 1999. Onward now employs over 400 personnel, including around 250 service professionals, with 35 employees based in the U.S.

Onward Technologies

- ✓ Strong in IT-enabled engineering services, client/server and IBM AS/400 application development, as well as E-commerce and Web-enabled application development
- ✓ Expertise in manufacturing (process & discrete) and banking industries
- ✓ Focus of methodology is on domain knowledge

Apart from the multi-skilled people employed -- its main assets -- the company has capabilities to effect remote delivery of projects and services, helping customers enhance their competitive edge. Onward is well geared to provide services to customers globally, including North America. Onward has designed and deployed systems to ensure that the quality and delivery schedules of its products and services meet or exceed customers' expectations. Onward has already initiated steps towards achieving ISO9000 certification for its systems.

Onward's Vision

The vision statement of Onward Technologies is;
"...to provide a competitive edge to customers with multi-skillsets equipped with state-of-the-art Information Technology tools, value added professional services for the global market..."

Main Business Activities

The business activities of Onward are handled through four Strategic Business Units (SBUs), namely:

- Manufacturing Software Solutions Division (MSSD)
- Process Software Solutions Division (PSSD)
- Banking Software Solutions Division (BSSD)
- Software Development Services Division (SDSD)

Manufacturing Software Solutions Division (MSSD)

Mission statement:

"...to provide cost-effective professional services and consulting to clients using SevenCs Technologies (CAD/CAM/ CAE/CAPP /CIM /CAPE/CAID) to enhance their product development and manufacturing activities to international standards..."

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MSSD at Onward offers skills in knowledge-based services and consulting in Mechanical Design Automation and Manufacturing Technology. Specifically, Onward offers services in the following areas:

- 3D Modeling and Conversion
- Product Design Support
- Simulation and Analysis
- Tooling and Manufacturing Support
- Reverse Engineering
- CAD Implementation
- PDM Implementation

Onward's MSSD relentlessly pursues its goal of providing the right mix of 'best technology' and 'best people' in order to achieve the best possible results for customers in the discrete manufacturing industry. This claim is backed by over one thousand person-years of experience in delivering solutions and services based on SevenCs technologies and tools.

Process Software Solutions Division (PSSD)

Mission statement:

"...PSSD aims to assist companies worldwide, in building their process modeling infrastructure, by exploiting the contemporary and emerging areas in Process and Information Technology...."

PSSD at Onward, with an appropriate blend of versatile software engineers and process technologists and an accumulated knowledge base of more than 150 person-years, has the right combination of professional skills and experience in applying CAChE (Computer Aided Chemical Engineering) tools to solve real life process problems.

PSSD's professionals have wide experience in using various process modeling and mathematical analysis packages including; DesignII, Chemtran, AspenPlus, ProII, InfoPlus, PIMS, Matlab, Mathematica, MathCAD and TKSolver. Apart from process simulation and modeling skills, PSSD's engineers have advanced skills in many programming languages, including VC++ and VB.

PSSD has capabilities in the following key areas:

- ***Process modeling and simulation***

PSSD's team is adept at building and validating process models of any complexity, using state-of-the-art commercial software packages. The validated models can then be used for a variety of studies, such as process de-bottlenecking, planning revamps, off-line optimization, to name a few.

- ***Real-time system design & implementation***

PSSD at Onward has designed and implemented real-time knowledge management systems using contemporary commercial software for clients in petroleum refining, fertilizer and pharmaceutical industries. PSSD also specializes in developing customized real-time applications, which provide plant operators with on-line diagnostics and advice for better, smoother and safer operations.

PSSD has extended its capabilities by collaborating with India's premier academic and research institutes, with a view to fully address the wide-ranging requirements of its customers by tapping the expertise of acknowledged experts in any problem domain.

Banking Software Solutions Division (BSSD)

BSSD at Onward offers software driven total solutions and services to the banking industry and is strong in banking domain knowledge, software development skills and system integration.

BSSD has developed a range of software products for the Banking Industry. The products, developed in-house, address all aspects of front-office and back-office operations of a Bank at the branch level.

BSSD's primary areas of focus are:

- Retail Banking
- Corporate Banking
- Foreign Exchange Trade Finance
- SWIFT Connectivity
- Tele-Banking
- Internet Banking

BSSD's experts endeavor to understand the specific needs of individual banks and deliver customized versions of their software products to satisfy these needs.

BSSD's customer service network operates from over 35 locations across India, providing high quality services that meet and often exceed customer expectations.

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Software Development Services Division (SDSD)

Mission statement:

"...to provide global customers with Application Software Solutions and services using state-of-the-art Application Software Development processes and tools which in turn will provide enormous business advantage to customers...."

SDSD at Onward addresses the global market through its development centers and marketing offices in India, the United States and the United Kingdom.

SDSD has successfully handled a variety of on-site, off-site and offshore projects for the United States and European markets, and has an established process for remote project delivery. This division has excellent exposure and experience in executing projects in a multi-cultural environment.

SDSD is primarily focused on the following development areas:

- Client-server application development
- Web-enabled application development
- E-commerce application development
- CORBA / COM / DCOM / EJB – component-ware
- AS/400 application development directory (NDS) enabled application development.

SDSD possesses skill-sets in the following areas:

Operating systems: Windows NT, Windows 95, OS/400
Programming languages: C, C++, Java, RPG/400, Cobol/400
Development tools: Visual C++, Visual Basic, Visual J++, JDK, UNIFACE, Oracle Developer 2000, Visual Café, Visual Age for Java, Cold Fusion
Database systems: Oracle 7.x, 8, Sybase 4.2, 4.9, 10, 11, MS SQL Server 6.5, DB2/400
Open database standards: ODBC, JDBC, JDBC-ODBC Bridg
Internet servers: Internet Information Server, Apache Webserver
Scripting languages: HTML, ASP, VB Script, JScript, JavaScript, Perl
Internet development tools: FrontPage, Visual Interdev
Protocols: HTTP, RMI
Component Technology: CORBA, COM, EJB
Web application servers: Websphere, IONA/Orbix, Cold-Fusion, Jrun, Weblogic
Analysis / Design & PM tools: Rational Rose, Visual Source Safe.

Projects executed by SDSD include:

- A Java interactive development environment (IDE)
- News agent for information aggregating over the Internet
- Regression test analysis suite for Silicon Graphics Windows NT-based APIs
- CUI to GUI conversion and Web-enabling of a transport and logistics solution.

Onward's Strategic Positioning

Onward claims the main differentiator between themselves and the other players in the area of offshore services is "domain knowledge". Onwards' model places considerable emphasis on studying and understanding the problem domain and operations of the customer. This results in the delivery of customized, meaningful solutions to customers that enhance their competitive edge.

Onward carefully nurtures and continuously refines its competencies. Its people possess extensive domain knowledge and a wealth of experience in discrete manufacturing, process manufacturing, and banking. Onward successfully combines world-class domain expertise with high-level skills in software development, conferring considerable benefits to its customers.

Case Study

Menon and Menon Ltd

Menon and Menon Ltd., is a leading supplier of intricate automotive castings to major automobile manufacturers in India and the U.S. (General Motors).

Project Scope

The broad category of service rendered by Onward was Tooling and Manufacturing Support.

- Solid Modeling of automobile cylinder heads (two numbers, with slight differences)
- Tooling; involving core & cavity generation, and generation of core prints and patterns.
- Generation of solid model of water jacket, and tooling
- CNC Tool Path Generation using CAM software for manufacture of the tooling

Project Execution Methodology

CAD engineers with prior experience in the discrete manufacturing industry were selected to execute the project.

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Two-dimensional paper drawings were supplied by the client and two independent groups were established to study them and calculate the timeframe of the project. Delphi Technique was used during the project timeframe estimation process.

Plant Visit & Project Planning

Subsequently, a visit to the customer's plant was arranged to understand the conventional methodology and processes employed in the tooling of a similar cylinder head.

Based on the above inputs a detailed Project Plan was drawn up, including; task allocation and scheduling, milestone identification, quality control plans, project review plans, and acceptance tests.

Three Phase Project Execution

Phase I: Solid modeling of components, namely; Intake port, Exhaust port and modeling of Cope and Drag.

Phase II: Generation of core prints and core cavities for the Intake and Exhaust Ports.

Phase III: Generation (modeling) of water jacket using Phase I components.

In each of the three phases, CNC tool path generation was completed for every component / tool as soon as the modeling was completed, and after consultation with the customer's tool room personnel regarding manufacturing strategies.

Quality Checks and Acceptance Tests

Before forwarding the tooling for the actual machining the part dimensions were cross-checked based on an ABC analysis of the dimensions. This minimized rework on the manufactured toolings.

Project Deliverables (electronic format)

- Solid models of all the components, the water jacket and all tooling.
- Toolpaths and Part Programs for CNC machining of the models.
- Stage-wise manufacturing drawings for the tooling.

Customer Benefits

The most tangible benefit was the reduction in the total cycle time (to half the time taken by the conventional process). Other significant benefits were better quality of components and tooling, less rework and cost savings.

Software and Hardware Utilized

The entire project was executed using IDEAS Master Series software running on a heterogeneous network of Unix and Wintel Workstations.

Sample Customers

Customer	Industry	Service Provided	Project Details
ABB, Stal, Sweden	Rotating M/cry manufacturing	3D modeling and conversion; Assembly	• Solid modeling and detailing of turbine components using IDEAS Master Series software
Recycling Machinery Manufacturer, Scandinavia	Special M/cry Manufacturing.	3D modeling and conversion; Assembly	• Solid modeling and detailing of Recycling M/cry parts using Autodesk Mechanical Desktop and Genius Desktop software • Assembly of these parts
AspenTech, Asia-Pacific	Process industry	Hotline (E-mail) support to customers of AspenTech's process simulation software in the Asia-Pacific region.	• To develop and simulate steady state models of plant processes to solve customers' problems • Solution delivery through Internet (Email/FTP)

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Origin

Contact Information

U.S. offices
8320, Montgomery Road
Cincinnati, OH 45236

Telephone: (513) 793 4334
Fax: (513) 793 5062

S. Ramesh
General Manager - Marketing
E-mail: SR.Ramesh@us.origin-it.com

2518, Mission College Boulevard
Santa Clara, CA 95054

Telephone: (408) 764 2250
Fax: (408) 764 2222

Bankim Shroff
Senior Manager – Business Development
E-mail: bankim.shroff@us.origin-it.com

India office
Origin Information Technology India Ltd
126/127, SDF IV, SEEPZ, Andheri (East)
Mumbai - 400 096

Telephone: (91-22) 829 2900
Fax: (91-22) 829 2744

Uday Gharpure
Managing Director
E-mail: uday.gharpure@in.origin-it.com

www.origin-it.com

Company Background

Origin has inherited over 15 years of rich history from its illustrious parents. Origin was formed in January 1996 with the merger of BSO/Origin - a leading management consulting firm in Europe and Philips Communications and Processing (C&P) Services.

Joint strength of the two companies immediately established Origin as a top-tier global IT services company. It brought together more than 10,000 professionals working in 27 countries in Europe, the Americas and Asia-Pacific (now 17,000 in 32 countries). The company has 1600 professionals located in the United States. During 1996, its first full year of operation, Origin achieved US$ 1.1 billion in net sales, two years later achieving revenues of US$ 1.8 billion. Origin has established a Global Software Factory in India, offering services to software product developers, premier corporations and banks. The Global Software Factory deploys a global service delivery model, assisting customers with solutions in ERP, e-business, and custom-built systems. Assessed at SEI CMM Level 4, the Global Software Factory industrializes the software creation and management processes to provide world-class service.

Origin

- ✓ Offers complete end-to-end, e-business and ERP services, with global service delivery
- ✓ Ability to leverage Global Alliances with the likes of SAP, Baan, QAD, Concur, Ariba
- ✓ Industry focus: Hi-Tech/Electronics; Process and Life Sciences; Fast Moving Consumer Goods; Finance, Banking and Insurance
- ✓ Special Services for Software Product Industry

Main Business Activities

Origin's primary emphasis is on helping customers improve their business results by delivering creative information technology services on a multi-site, global scale. Origin has developed service offerings based on their vast experience in specific industry sectors such as:

- Hi-Tech/Electronics Industry; Process and Life Sciences Industry; Packaged Consumer Goods Industry
- Software Industry
- Finance, Banking and Insurance

After years of IT experience, Origin is able to craft technology solutions that fit each clients' unique cultural and organizational needs. The result: long-term relationships with leading companies worldwide. Moreover, Origin believes in building relationships with their customers so that, ultimately, Origin can assist them in managing the total enterprise lifecycle.

Origin services customers primarily through their three divisions:

Enterprise Solutions, which offers industry based, enterprise wide solutions based on three leading ERP packages – SAP, Baan and QAD. The extended offerings of Enterprise Solutions cover E-Commerce

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solutions for Business-to-Business, Business-to-Employee and Business-to-Consumer.

Professional Services, covering customized solutions ranging from management consulting to software development and system integration.

Managed Services, which covers managing and operating (end-to-end) the applications and technical infrastructure.

Offshore Service Capability

Offshore services, launched in 1991, contribute a major proportion of Origin India's service offerings.

Offshore services are offered mainly using the "Production Line" construct specially designed and tailor made for the Customers. Application of the Production Line results in a unique and specific service delivery mechanism for each of Origin's customers.

Offshore services include the following:

Global ERP Software Factory

The Global ERP software factory offers implementation, customization, development, technical support and migration assistance services, based on three leading ERP packages, SAP, Baan and QAD.

SAP – Origin is amongst the top-five SAP Alliance Partners - with 2,500+ resources

Baan – Origin was the first and remains the largest Baan Partner - with 1,100+ resources

QAD – Origin was the first and is still amongst the largest QAD partners - with 450+ resources

Origin consultants also help in redesigning or realigning the business processes, as well as managing the change process.

Origin's global ERP software factory based in Mumbai – India, incorporates Front Office support for customers, whatever their time and geography zones. This gives Origin customers world-wide responsiveness with a commitment to quality, consistency and speed.

Some of the other key advantages of Origin in this area include;

- Assured quality, but with a focus on cost effectiveness
- Right output with minimum input – programs are no longer dependent on individuals; their factory approach ensures easy maintenance and on-going support to clients
- Mature quantitative Process Management practices
- Track record of high-levels of customer satisfaction
- Services go beyond implementation to cover ongoing services such as application management and maintenance, system management, network operations, technical and user support
- Ability to set up a Customer Competence Center giving 24x7 support.

Business Application Services

Origin India's expertise in this application area includes Software Engineering Services for Product Developers of ERP, Asset Management, Logistics, Retail and Accounting.

In addition to the above, Origin has specifically designed services for providing custom-built solutions to Banking and Finance organizations and other large corporations. Origin has considerable experience in servicing customers in these areas, but also continually works to broaden its expertise.

Some of the other advantages of Origin in this area include;

- Customer-oriented approach, based on balanced scorecards aligned with client strategy
- State-of-the-art technology skills
- Capability to build and sustain new skills in the most effective manner
- Origin ensures confidentiality -- with legal agreements and back-up guarantees from an Origin organization located in the same country
- Cost effective approach due to their Offshore methodology

Technical Automation Services

Origin India has experience and expertise in the field of Real Time, Scientific and Industrial Applications, which often require close interfacing between hardware and application software. By successfully servicing a number of customers, Origin has demonstrated that offshore projects and Production Lines are also suited to this complex field.

Some of the key advantages of Origin in this area include;

- Origin provides services to product developers, which encompass all phases of the "Product Creation Process", starting from requirement gathering to support during beta testing

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- Offers the full spectrum of software support for platforms ranging from open systems to proprietary firmware
- Specialized in development of scientific, engineering, real time embedded software applications in various areas, such as automotive, medical, communication, consumer electronics, process control equipment, etc.
- Technology support for Microsoft platforms (COM/DCOM/ ActiveX, WinCE, XML etc.), Real Time Operating Systems, UNIX variants, including Linux, Web enabling, etc.

Technical Platforms

Origin's offshore services group, based in India, has expertise on the following platforms:

E-Business: Ariba, BroadVision, Concur Technologies
ERP: SAP, BAAN and QAD
ERP tools: ABAP, Baan Tools and Progress
RDBMS: Progress, Oracle, SQL Server, Access, DB2
Languages: Visual Basic, Visual Foxpro, VC++, Visual Age Java, ASP, HTML, DHTML, HTML/ASP, VB script, Java Script, Lotus Notes, Developer 2000,ER/win, Java, C,C++, Assembly Languages, COBOL, AS/400 COBOL and RPG
O/S: WinCE, Unix, Linux, Windows 98/NT/2000, Real Time Operating Systems

Origin's Global Service Delivery Model

Origin's global service delivery model has two main features:

- Total alignment with customer's strategic goals
- Offshore, yet local service delivery

Origin India realizes that software engineering activities form a crucial part of their customers overall IT strategy.

The first feature of customer alignment implies that Origin takes steps to ensure that:

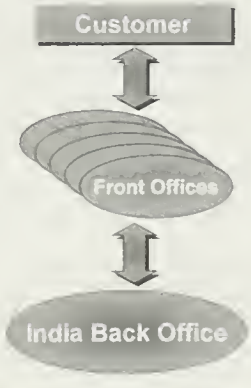
- The software factory services help the customers use their own skill base in the most efficient way
- A virtual extension of customer's own skill base is created in the software factory
- Operationally, the software factory is fully aligned with the operational principles of the customer
- The total end-to-end operation of the factory is continuously improved for better productivity, quality and cycle time
- The operations of the factory are prioritized in a way that allows Origin customers to delight their own customers
- On an overall basis, the total operation generates a high level of financial effectiveness

Origin has designed and refined the Production Line constructs, which are created on a tailor made basis for supporting customers and achieving above goals.

The second feature of global service delivery is necessary to ensure that a global software factory is successful in taking care of regional, cultural and local business practice needs. The global presence of Origin allows them to set up customer facing front offices in appropriate time zones and create a seamless information network from people in the customer organization, through people in the front offices to people in the factory.

High level of people orientation and cultural proximity help Origin provide sophisticated, efficient and industrialized software processes to customers, combined with a high level of customer intimacy.

Organized for Global Delivery



Case Study

QAD Inc.

Objective

QAD Inc. (QAD) manufactures and distributes Enterprise Resources Planning (ERP) and extended supply chain management software and services to multinational companies with a special focus on the mid-market.

In efforts to re-define their business model and concentrate fully in new product design and development, QAD outsourced its Software Engineering Maintenance activities for existing software releases to Origin.

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Business Challenges

Redefine the business model to concentrate fully on product design and development and free essential staff from Product Support.

Implementation

Origin designed an outsourcing process that delivered measurable results and achieved the desired goals. The performance measurements included,

- The number of problems tackled per month
- How fast problems were resolved
- How many problems persisted
- Response time to high priority customers
- Defect rate in software releases

The 'Production Line' was set up after a pilot project, to give complete third level and partial second level support remotely for standard MFG/PRO software modules in six functional areas: distribution, manufacturing, finance, support management, systems management and object based component model 1 (OBCM1).

The Results

Origin far exceeded Client expectations.

- QAD's Standard Product Global Support group saw a cost reduction of 50%
- Service request response time was reduced by 20%
- Amount of Software Support reworking required was reduced to 0.08%
- QAD won the Ziff-Davis Award for Best Support Center in Q2 1998

Why Origin?

Origin was already an established business partner with a demonstrated capability in QAD's product. But also Origin's innovative approach in setting up a Production Line dedicated for QAD was a major selection factor. This helped establish a service philosophy aligned with QAD's own objectives.

Sample Customers

Customer	Industry	Service Provided	Project Details
Procter & Gamble	Fast Moving Consumer Goods	SAP implementation and global ABAP factory	• Global core Financials, SD, and HR Reporting • ABAP support in Asia • Global pilot in EMEA
Philips Semiconductors	High Tech/ Electronics	Baan customization, implementation and 24x7 support	• Development/ Customization • Implementation of ATO Manufacturing Control system on Baan • Ongoing support services
Unilever	Fast Moving Consumer Goods	MFG/PRO customization and implementation	• MFG/PRO customization and implementation for Unilever subsidiaries in Cuba, Egypt, Morocco, Saudi Arabia, UAE and India
QAD	Software Product Developer	Maintenance of MFG/PRO and extension of their support services	• Established a Production Line for QAD in Mumbai – India, for 2nd and 3rd level support for standard modules in six functional areas
Philips Analytical	High Tech/ Electronics	Technical Automation	• Execution of various software development projects, enhancements and migrations for scientific applications under Origin's 'Production Line' frame work

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Planetasia.com Ltd

Planetasia.com

- ✓ Planetasia.com -- the "e-Transformation Technologists" -- combine Web strategy consulting skills, application development skills and creative design skills to offer the following offshore Internet services:
- Business to Business E-Commerce solutions
- Business to Consumer E-Commerce solutions
- Portals
- Brands on the Web
- Application Service Provider (ASP) solutions
- Knowledge Management solutions
- After Markets

Contact Information

Planetasia.com Ltd.
20370, Town Center Lane, Suite 240,
Cupertino, CA 95014

Telephone: (408) 366 1205
Fax: (408) 252 8020

Ashish Mahadwar
Vice-President
Email: ashishm@planetasia.com

www.planetasia.com

Company Background

Planetasia.com, a group company of Microland, is among the first Indian Internet Business Solutions companies to aggressively pitch the Web as a business tool.

ICICI Venture and Chase Capital Partners have been Planetasia's funding partners in their two rounds of funding. In their third fiscal year (1999), Planetasia.com achieved revenues of approximately US$ 2.2 million, with around 35 percent of it generated from business in North America. The company presently employs over 170 professionals.

Planetasia.com has developed a strong international presence with eleven clients signed up and many more in the pipeline. Apart from the U.S., Planetasia.com has also acquired business in South East Asia and Europe. Their client base includes many of India's Top 100 organizations and one of the world's Top 3 consulting companies.

Planetasia.com - The e -Transformation Technologists

The Internet is challenging traditional paradigms, breaking down old business models and throwing open huge opportunities for progressive corporations, while simultaneously posing a threat to those slow to recognize these changes.

Planetasia.com partners with organizations worldwide, enabling them to leverage the Web for powerful business and competitive advantages.

Planetasia.com was a pioneer in the Indian market - setting high standards in Information Delivery and Interface Design. They were amongst India's first Internet Solutions Companies to recognize that the Web is a strategic imperative for corporate organizations, and soon expanded their service offerings to encompass services in the fields of B2B and B2C E-Commerce, Portals, Brands on the Web, Application Service Provider Solutions, Knowledge Management Solutions and After Markets. This range of Internet solutions from Planetasia.com is aimed at creating winning dot-com companies, as well as preparing existing organizations to cope successfully with the on-line era.

Planetasia.com believes the Web is a lifetime engagement for clients, and they have built skills and competencies to partner their clients throughout the life cycle of a Web solution – which they visualize as having the following phases:



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Main Business Activities

En route to making their presence felt in high value segments like Retail, Financial Services and Media, Planetasia.com delivers customized business solutions. These include:

Business to Business E-Commerce Solutions – Planetasia's B2B e-commerce solutions cover Digital Market Places and Supply Chain Management solutions. Through alliances with the leading platform solution providers, Planetasia.com has built a strong proposition in building e-procurement and Digital Marketplace solutions. Developing Web solutions that integrate with customer's legacy systems, Planetasia.com builds Supply Chain Extranets that link suppliers and distributors, providing seamless connectivity, reducing cycle-times, increasing customer service, and reducing costs. They have developed expertise in integrating auction engines, payment gateways and linking exchanges into suppliers' back-end systems.

Business to Consumer E-Commerce Solutions – Planetasia.com builds robust and personalized B2C E-commerce solutions that include e-brokerages, e-tail sites etc. that span all stages of the commercial process - including product catalogues, shopping carts, order processing, inventory, warehousing, payment systems and logistics. With their keen understanding of personalization tools and techniques as well as skills in the Customer Relationship Management sphere, Planetasia.com works with organizations to help them strengthen bonds with their customers, thus realizing higher life-cycle revenues from each customer.

Portals - Having built over a dozen large specialized and general purpose portals, Planetasia.com has built competencies and skills in leading platforms and technologies needed to build successful solutions in this space. Planetasia.com understands the time-to-market criticality in this space, and Planetasia's suite of I2I (Idea to Implementation) processes enable it to move rapidly on such projects.

Brands on the Web - Planetasia.com uses their understanding of the Internet as a marketing medium to provide strategies and solutions for developing Brands. Combining the Web's interactive nature with its capacity to foster communities centered around common interests, Planetasia.com has helped their clients in building strong brands on the Web.

Application Service Provider (ASP) Solutions - Skyrocketing demand for anytime, anywhere information has made Internet-based outsourced applications and Application Service Providers not just a trend but a fact of doing business. Planetasia.com is building one of the first ASP solutions for a Singapore headquartered organization. Using the Enterprise Java Beans (EJB) framework, and integrating technologies from Oracle (Oracle 8I), IBM (Websphere) and Sun, Planetasia.com has architected and is building an extremely robust, and scalable ASP solution.

Knowledge Management Solutions - Planetasia.com has partnered with a number of organizations to build for them Knowledge Management solutions that help transform these organizations into knowledge corporations. Planetasia's solutions help these organizations capture, disseminate, share and re-use knowledge that exists within and outside their organization to give them a strong competitive advantage in the new Internet era.

After Markets – Planetasia.com recognizes that building a Web-solution is only the beginning of a customer's journey on the Web. Making sure that the relevant clients come to the site, and personalizing messages and promotions based on customer's preferences, falls in the gamut of Planetasia's After Market offerings. These offerings include strategic advice services, advance reporting and search engine optimization and other allied services that enhance the value of their Web solutions.

Planetasia.com has built expertise in the following high value segments:

Retail – Planetasia.com has a close understanding of best-of-class practices as well as the technologies required to make the Online Store a successful business venture. They have executed several projects in the Retail segment that include strategy consulting for one of India's largest supermarket chains.

Financial Services – Planetasia.com has gained expertise in both e-brokerage solutions and Internet Banking. They have worked with a number of Online brokerage houses to develop solutions for Online trading.

Media – Planetasia's domain knowledge of the media space has been strengthened by the strategy consulting projects they have completed for five leading publications houses. They are also developing portals for three major clients in this segment.

Integrating Diverse Skills

Building successful Web Solutions requires a set of diverse skills, and Planetasia.com has successfully acquired and integrated these diverse skill-sets and competencies.

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They consist of:

Business Consulting Skills – Planetasia.com offers both Strategic and Tactical Consultancy. Strategic Consultancy helps draw a Web Blueprint for clients – to leverage the Web in order to address new business opportunities. Tactical Business Consultancy looks at internal efficiencies by improving processes, and has cost-saving implications for clients.

Applications Development Skills – Applications that power Web Solutions require strong software skills across multiple platforms (e.g. Microsoft, IBM and Oracle), languages (e.g. Java, VB, XML, etc.), middleware (e.g. DCOM, EJB, CORBA) and business scenarios (e.g. Supply Chain Management, Knowledge Management, Enterprise Application Integration, etc.). Planetasia's skills cross a wide range of relevant Internet technologies ensuring that they build optimal solutions for clients.

Creative Design Skills – At Planetasia.com, Creative Design transcends the concept of attractive graphics alone and embraces the areas of navigation and information structuring, that are critical to ensuring that users have a pleasant, intuitive and memorable experience of the Web site.

Solution Architecture Skills - The Planetasia.com Application Architecture Lab (PAAL) architects the Internet solutions that they build for their clients. Activities of this Lab include Make vs. Buy decisions for software platforms and components, choice of the software platforms, and the hosting and networking architecture (if relevant) for solutions. This lab also conducts the load and stress testing for the solutions that Planetasia.com builds, and their services are available on hire for other Internet Professional Service providers.

Technology Strengths - Combining the above skills on the bedrock of technology, Planetasia.com delivers effective Web solutions. Internet technologies are evolving rapidly alongside the medium itself, and Planetasia.com, through its unique New Media Research Laboratory (NMRL), keeps abreast of them. This ensures that they build state-of-the-art Web Solutions that can scale correspondingly with the growth in their clients' needs. Their key technology skills are in the area of presentation logic, data modeling, user interaction logic, component standards, application servers, databases, programming languages, infrastructure servers, personalization systems and content publishing systems.

Processes - Planetasia.com has developed in-house processes and frameworks - InfoDesign™ process and the ONE℠ Framework - that ensure timely and quality delivery of Web solutions. Planetasia's diverse skills and strong processes, combined with their deep understanding of the Web as a medium, guarantee consistent delivery of superior solutions to customers.

Strategic Alliances

Planetasia.com works closely with world leaders in technology - an association that brings clients the best of solutions. Their partnerships bring them huge technology and solution strengths that help build leading-edge Web solutions.

Planetasia.com has on-going alliances with Microsoft, Oracle, IBM and Intel. These partnerships help them keep abreast with the latest Internet development and deployment technologies. The exclusive training programs from these partners help them work out more efficient solutions to clients in less time. With complete knowledge of their partner's roadmaps, Planetasia.com believes they can "future proof" the solutions built for clients.

Pricing Models

Planetasia.com has the ability to work with clients on a project basis – with fixed scope, fixed time frames, and fixed cost. Project Management and associated project risks are borne by Planetasia.com. This ensures that clients have an accurate idea of what their outlay on a project will be, and are ensured of fixed and tight deadlines.

Case Study

EcomCFO.com – An Application Service Provider (ASP)

Background

Aimed at delivering business solutions and services over the Web to small and medium enterprises across geographies, this solution is a unique integration of several cutting edge technologies - Enterprise Java Beans (EJB) Framework from Sun, Websphere Advanced Server 3.0 from IBM, and the database from Oracle Corporation. This will be one of the first implementations of EJB in such a solution.

Uniqueness of this solution

- A pioneering ASP solution of this scale and magnitude
- One of the first few live EJB implementations
- Ability to store and process data locally on a client PC, or on a remote secure server.
- Unique integration of several cutting edge technologies – Enterprise Java Beans (from Sun), Websphere 3.0 (from IBM) and Oracle 8 (from Oracle)

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Challenges of the project

A complex and cutting edge project of this magnitude throws up a lot of challenges. Some of them were:

- Ensuring rapid assimilation and deployment of cutting edge technologies
- Integrating technologies from different vendors
- Maintaining performance and scalability, with complete security.

The technical architecture of the ASP solution

The critical success factors of this solution are reliability, water-tight security, high scalability, and no compromise on the performance. The solution has been architected to deliver flawlessly on each of these factors.

The Web is synonymous with speed, and hence rapid application development and deployment is a critical factor. To be able to deliver on the critical success factors, and meet the challenge of rapid deployment, without compromising on security, Planetasia architected this solution around the latest "Enterprise Java Bean (EJB) framework". The application will be developed & deployed using a blend of servlets-EJB-Websphere3.0-Oracle on Sun Solaris. Visual Age for Java is being used as the development tool.

Planetasia.com is using a multi-tier approach for the architecture, hence this architecture has different components including a Web server, an application server, a database server (all on separate physical servers) and finally a Java Virtual Machine enabled browser at the client. This allows the achievement of:

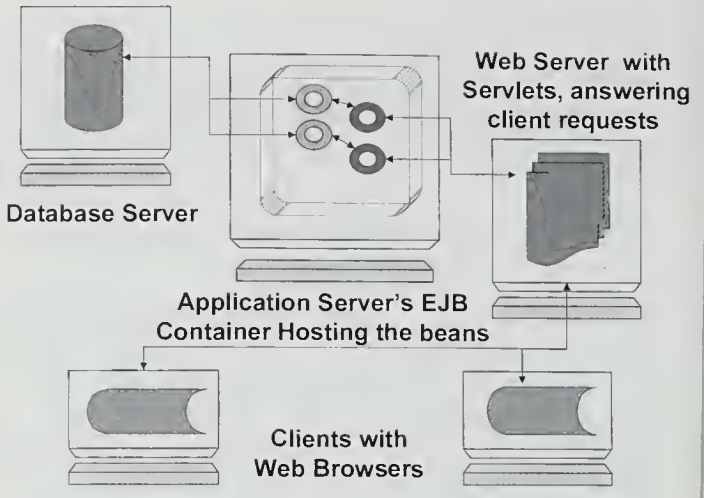
- Scalability and load balancing
- Performance management
- Reliability & high availability
- Higher data security
- Software management

All of which are critical to the success of this solution. The architecture also allows the flexibility to design the hardware architecture in such a way that the resources on each and every server are being effectively used.

The application also provides the online payment facility through credit cards. The high-level architecture of this solution is illustrated in the exhibit shown on this page.

The salient features of this architecture are:

- The EJB framework defines an EJB container which handles application logic concurrency, pooling of database connections, session-state management and low level database commands.
- With respect to cost and performance, the architecture provides a very favorable MCVP (Marginal Cost Versus Performance) factor.



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Polaris Software Lab

Contact Information

India office
Polaris Software Lab Limited
Polaris House, 713, Anna Salai,
Chennai - 600006

Telephone: (91-44) 852 4154
Fax: (91-44) 852 3280

Rajiv Malhotra
Vice President – Corporate Planning
Email: rajiv.malhotra@polaris.co.in

U.S office (Banking, Financial Services Practice)
Polaris Software Lab Limited
38750, Paseo Padre Parkway, Suite # A7,
Fremont CA 94536

Telephone: (510) 645 9986
Fax: (510) 645 9984

K Srinivasan
Vice President, U.S. Sales & Marketing, BFSI Practice
Email: ksri@polaris.co.in

US office (Retail & Telecom Practice)
104, South Hyde Avenue,
Iselin, NJ 08830

Telephone: (732) 634 8005
Fax: (732) 634 7709

C Raghuraman
Senior Vice President & Head US Operations
Email: rrc@polaris.co.in

www.polaris.co.in

Company Background

Polaris Software Lab Limited is a reputed software services company, with headquarters in Chennai - India, providing quality and timely information technology solutions for mission critical applications. Polaris is amongst the fastest growing software service companies, with an annualized growth rate of over 100%, since its inception in 1993.

Polaris Software Lab

- ✓ Continuing focus on Banking, Financial Services and Insurance (BFSI); supported by professionals with domain and technical expertise
- ✓ Defining itself in *'e-space'*
- ✓ Emerging verticals- retail and telecom
- ✓ Partnerships in the EIS spectrum (Oracle, Baan, Siebel, Top Tier)
- ✓ Preferred approach for providing offshore services through building and sustaining long term relationships with clients
- ✓ Global reach with dedicated local resources

Polaris currently employs more than 1,150 professionals, with over 4,500 person years of experience, achieving revenues of more than US$19 million in its 1998/99 fiscal year.

Polaris' Citibank ENTITY, its offshore relationship model, was assessed to SEI CMM Level 4 in 1998. The KPMG Quality Registrars have also certified Polaris as an ISO 9001 company.

In North America Polaris has offices in New Jersey, Atlanta, Freemont and Los Angeles. In Europe and South East Asia, Polaris operates through its wholly owned subsidiaries in London and Singapore, respectively. In addition, Polaris also has operations in Sydney - Australia and the Middle East. In India, Polaris has Development Centers in Chennai, Navalur (near Chennai), Noida (near New Delhi) and offices in Mumbai, Bangalore and Hyderabad.

Polaris ENTITY

Polaris has proven capabilities in managing successful offshore development centers, including outsourcing. Polaris' offshore development model, "ENTITY" (ExteNded Technology FacilITY), is a proven concept. A long-term relationship with the customer is at the core of the model. The major advantages of the ENTITY model are operational efficiency, cost savings, training and strategic advantage.

Through ENTITY the company endeavors to deliver 80% of the work offshore by a team of technology architects, business analysts, system analysts, testers and developers. The remaining 20% represents the support team at the site itself, which is overseen by the Relationship Managers. Furthermore, a continuous line of client communication is offered by Polaris, using well defined, pre-signed off interaction models, systems and processes.

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Main Business Activities

The main business offerings of Polaris include:

Offshore Development utilizing ENTITY – Polaris' offshore relationship model

Professional Services

1. ERP
2. Migration & Re-engineering
3. Enterprise Relationship Management Services (SCM, CRM)
4. E-Business Services
5. Consulting Services

Enterprise Management Services

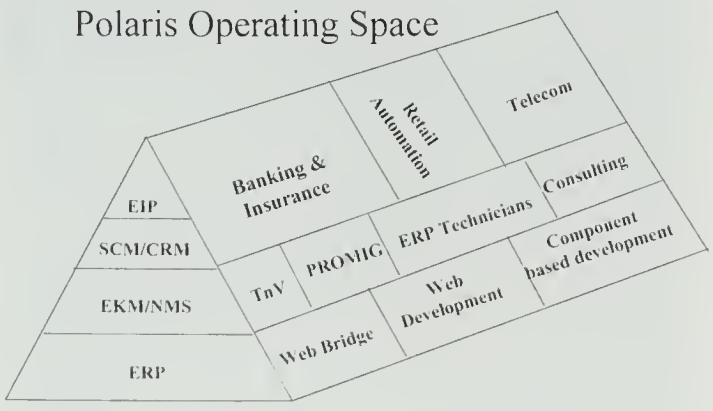
1. Enterprise Network Management (ENM)
2. Enterprise Knowledge Management (EKM)

Software Products

1. *Inspire* for Software Process Improvement and Management
2. *Web Hotline* for real-time query handling and support
3. Retail automation solutions - *SuperStore XS* for small and medium one-off retailers and *Nterprise* for retail branches across regions.

In addition to expertise in the technology environment, Polaris is working extensively in the domain areas of Banking & Finance - trading & risk management in particular, Retail Automation, E-Commerce and Knowledge Management.

Polaris' capabilities in the Vertical & Horizontal space can be encapsulated in the following pyramid:



Note: PROMIG is a migration methodology applied by Polaris, while TNV is an abbreviation of Testing & Validation services.

Vertical Industry Expertise

Banking, Financial Services & Insurance

Polaris' dedicated Strategic Business Units focus on solutions in Retail Banking, Credit Card, Trading & Risk Management, Investment Banking and Insurance. The solutions cover a wide range of services ranging from simple check processing to developing a complete Asset Liability system. Most solutions provided are full life cycle software development projects, whereby Polaris provides the combined advantage of specialized domain expertise and contemporary technologies – an example being Citibank India for whom Polaris develops and maintains end-to-end banking solutions. The case studies and sample customers cited highlight the depth of Polaris' expertise in this domain.

In the Insurance domain, Polaris is the development partner for Deloitte Consulting. In addition, Polaris has plans for working on a tool called AMARTA, which will be a Business Process Implementation Environment designed specifically for the insurance industry.

Retail

In order to provide focus to the retail market segment, Polaris incorporated Polaris Retail Infotech Ltd. (PRIL), a 100% Polaris-owned subsidiary. PRIL has designed and created an Architecture for Retail Transformation (ART), and has a vision to provide total retail solutions for the global retailing community. PRIL provides solutions to transform the retail business with offerings ranging from inventory management, point-of-sale customer interface, integrated accounting, to e-retailing.

Telecommunication

CygNet is an Integrated Network Management System, providing a complete solution for the management of Telecom and Data Networks, consisting of a large number of network elements supplied by many different vendors. It allows the network operator to monitor and control all the elements in the network and provide the status and traffic details of the network and information about the network elements themselves.

CygNet is completely Java based with an excellent GUI, and is developed on the Web NMS platform. By virtue of the use of Java, it can run on different platforms ranging from low end PCs running Linux or Windows NT to high end Unix workstations. It is designed to support both SNMP and TMN / Q3 standards and also elements with proprietary console management.

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The main features of the easily customizable CygNet are Traffic Monitoring, Fault Management, Performance Management, and Security Management.

Horizontal Expertise

ERP and ERM services

Polaris has set up competence centers for both Baan and Oracle applications. Polaris has proven expertise in the areas of optimization, new sessions development (for Baan), integration of third-party tools, migration services and development of new reports and customization of existing reports/forms. With tools and services designed specifically for each stage of an ERP implementation, Polaris draws its strength from a vast pool of experienced consultants.

- **Offshore Report Development & Customization**

Often implementation of a standard ERP package requires customization of reports and forms to suite unique business requirements of the client. Polaris addresses this need offshore from its India development center at Noida. By taking the work offshore, Polaris offers almost instant start of the customization project, along with substantial cost savings (up to 50%). This model is backed by a tried and tested methodology that promises smooth project execution.

- **Integration with Third Party Software**

At times, the functionality of the ERP package does not cover your business requirements comprehensively. Polaris offers services to develop a system that fits requirements by integrating third party products to Oracle Applications. Integrating front-office business systems, such as Voice Link, Sales Force Automation systems, PoS, etc., to Oracle Applications, enables organizations to take informed business decisions on a real-time basis.

- **Performance Accelerator Program (PAP)**

A study conducted among users of large ERP systems led Polaris to believe that most organizations that have more than 100 users, experience difficulties due to applications occupying several hours of critical system resources. Polaris addresses this challenge through PAP (Performance Accelerator Program), a unique performance improvement methodology evolved from their expertise in optimizing large and mission critical applications over the last 15 years. The benefits of PAP include:

- Generation of structured, standard, robust and optimized code
- Dynamic and concurrent batch processing
- Controls and data integrity, combined with hierarchical processing
- A common development methodology
- Easy maintenance of software
- Improved memory management
- Optimized use of system resources
- Drastically reduced run-time.

In fact, PAP has been proven to consistently improve system performance by over 35%.

- **Enterprise Relationship Management**

Polaris is an implementation partner for Siebel, which is the market leader in Enterprise Relationship Management solutions. Having re-engineered and implemented Siebel at multiple sites for a global Bank, Polaris now boasts of one of the most qualified Siebel teams in India.

Enterprise Knowledge Management

Polaris has been working on building technology blocks and processes, which contribute to the building of an effective Enterprise Knowledge Management System. The components in such a system may include; Enterprise Network, Enterprise Virtual Filing Cabinet, Workflow, Learning Systems and Enterprise Alert Systems. Polaris offers services in integrating each of these components.

At the pinnacle: 'E-Space'

Internet Banking Initiatives

Polaris recently completed the development of a large E-Commerce authorization project for a leading multinational bank operating in India and Eastern Europe. The project is slated for implementation later this year. The banking application has been built to provide a high level of transaction security, and was developed using Java and third party libraries. Polaris has developed a special secured protocol to communicate with the outside environment e.g. Internet Mall(s). Polaris is also currently involved in designing and developing a Next Millennium Banking product for a large Japanese based Software House (NEC). The system is being designed to facilitate transactions over the Internet, as well as handheld devices.

Enterprise Integration Portals (EIP)

Enterprise Integration Portal solutions provide, unique and powerful ways to integrate, navigate and simplify many of the core applications in medium to large enterprises. In this domain, Polaris is partnering with Top Tier for products built around the HyperRelational™ Technology.

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Web-enabling Product Suites

Polaris has Web enabled its Software Project Management Tool, Inspire, providing the project planners and developers with an easy and efficient method of planning, executing and controlling a project over the net. Planners and developers can review project plans or reschedule existing ones. The Web enabled Inspire can automatically generate consistent work plans that can be tracked, allow for the integration of various methodologies and calendars, and reassign tasks. Plans are also afoot for making the mini-ERP for the Retail Industry, Nterprise, E-commerce ready.

Case Studies

The Ganesha project

The client requirement called for the re-engineering of their existing solution to overcome inherent limitations of the current version.

The software – a construction and building solution – had been in existence for eight years and was installed in fifteen thousand locations. It had also been customized several times for different clients.

The product that Polaris was to re-engineer would be marketed globally.

Polaris was assigned to re-engineer the product with the aim of overcoming the limitations of the current system. The solution developed by Polaris meets the following objectives:

- facilitates plug-in applications, as and when required
- provides components to facilitate various functions
- supports both GUI and Internet clients, and facilitates differing GUI designs via a plug-in
- supports relational databases
- allows sharing of data among applications
- allows export and import of data from various standard data formats
- provides a component or modular approach
- facilitates exchange of data between various installations within the system

Citicorp Asset & Liability Model

An asset and liability system which serves as a management tool for decision making and provides a multitude of reports, including; price risk gap generation, factor sensitivity, market value sensitivity, cost to close, base case stress testing, EAR utilization, MCO utilization and a monthly review maintenance report. The solution has currently been implemented in 60 countries, with over 300 risk managers in Citibank Treasury using CALM on a daily basis for regulatory reporting, investment decisions and to run scenario simulations.

Sample Customers

Customer	Project Details
E-Citi, Los Angeles	Polaris has undertaken the migration, maintenance and re-engineering work for E-Citi, a Citicorp subsidiary in Los Angeles, USA. This is an on going project and encompasses the existing ATM and Home Banking application to be migrated from the legacy environment, maintaining the application and providing enhancements to the functionality. The application developed is being deployed in 10 countries in Latin America and 8 countries in Europe.
A leading Insurance house in the U.S. and Australia	Polaris is developing a full suite of solutions for this Client, primarily in the Life Insurance business area.
NEC, Japan	Polaris is one of NEC's development partners for its 'Global Banking Solution', to be completed by September 2000.
A leading clearing house based in Singapore	Polaris developed a system catering to the requirements of trading, settlement, risk evaluation and management in futures, options, foreign exchange and bullion commodities. The client required the system to interface real-time with market feeds (Reuters, Telerate, and Knight-Ridder) for revaluation and managing risks at the latest market prices. The system also imports trades executed on the Singapore Monetary Exchange (SIMEX) and exports Mutual Offset trades to the SIMEX host system.

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PricewaterhouseCoopers

Contact Information

PricewaterhouseCoopers Limited
Y-14 Block –EP, Sector -V
Salt Lake City
Calcutta – 700 091
India

Telephone: (91 33) 357 3384 up to 3390
Fax: (91 33) 357 3394

Rajarshi Sengupta
Executive Director
Email: rajarshi.sengupta@in.pwcglobal.com

www.pwcglobal.com

Company Background

PricewaterhouseCoopers was formally established in July 1998, bringing together Price Waterhouse (established in 1849) and Coopers & Lybrand (established in 1957) through a worldwide merger of equals. The Breakaway Firm is the largest professional services firm in the world, with a 150-year history of delivering value, employing more than 155,000 people in 148 countries with 867 offices worldwide. PwC is today the service provider of choice to the largest, most prestigious companies in the world with global revenue in excess of US$15 billion.

PwC-India is the largest of the 'Big Five' Consultancy firms in India with more than 3000 professional staff. The Management Consultancy division has nearly 1000 staff members based out of Calcutta, New Delhi, Mumbai, Chennai, Bangalore, Hyderabad, Pune and Bhubanshwar.

PwC Management Consulting Services

The Management Consulting Services (MCS) line of business provides services in the areas of Strategic Change, Process Improvement and Technology Solutions. The MCS service area currently has more than 31,000 Partners and Consultants worldwide. The revenues of the firm clocked a growth rate of 41% and have been growing the fastest among all leading management consulting firms over the past few years.

PricewaterhouseCoopers

- ✓ The focus of PwC's Offshore services is the development of Oracle and other RDBMS based solutions, development and customization of SAP, Peoplesoft, and Oracle Applications
- ✓ PwC possesses an integrated methodology for offshore development and maintenance work in the area of custom and ERP development
- ✓ Web-based access templates and prototypes for E-Business and Data Warehousing, which can be used to 'jumpstart' an offshore assignment
- ✓ Strength of infrastructure: 55,000 sq. ft. Technology Center in India, 512 Kbps IPLC link that provides direct access to any PwC ASEC center in the U.S.

The MCS practice is organized on a matrix basis, which aligns PwC services to specific market segments. The MCS practice is globally focused on five industry segments:

- Consumer and Industrial Products
- Energy and Mining
- Financial Services
- Service Industries
- Information, Communication & Entertainment.

The MCS practice is focused on providing end-to-end solutions to strategic clients in the above mentioned industry segments. The range of services provided are organized under three divisions, which allows them to take an idea from inception to reality.

- **Strategic Change**, including Corporate Strategy, Organizational Strategy, Information Technology Strategy, Operations Strategy and Change Strategy.
- **Process Improvement**, including Supply Chain Management, Information Technology Management, Financial & Cost Management, Human Resource Management and Market & Customer Management.
- **Technology Solutions**, including Enterprise Resource Planning, Global Systems Solution Center, Advanced Software Engineering Center, Data Warehousing and E-Business.

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Saltlake Technology Center (STC)

The PwC India Software Technology Center at Saltlake, a suburb of Calcutta, was set up in April 1995. This technology center houses the ERP (SAP, Peoplesoft and Oracle) Centers of Excellence, the Data Warehousing Center of Excellence and the E-Business Center of Excellence in India. Work on another 100,000 sq. ft. facility in Salt Lake, Calcutta, is underway and is expected to be operational by the end of 2000.

The STC is the center of activities for off-site development work for both domestic and international clients, using a proven offshore methodology for both development and maintenance.

This facility has a 512 Kbps IPLC connection to the global PwC network and is part of PwC's global WAN. The software processes at the facility are ISO9001 and TickIT certified. The center is working towards a SEI-CMM rating by the third quarter of 2000.

Offshore Service Capability

PwC began offering offshore services in 1992, and based on their standard offshore methodology, have completed a number of prestigious assignments. Using their state-of-the-art data circuit, PwC India has been able to develop a core competency in the area of offshore data and product services – the focus being the development of Oracle and other RDBMS based solutions, development and customization of SAP, Peoplesoft, and Oracle Applications. In addition PwC India has recently extended their offshore development skills in the following areas:

- Development of an integrated methodology for offshore development and maintenance work in the area of custom and ERP development.
- Emphasis on offshore E-Business and Data warehousing: PwC has developed Web-based access templates and prototypes for these two areas that can be directly used to jumpstart an offshore assignment.
- PwC India has a 512 Kbps IPLC link that provides direct access to any PwC ASEC center in the U.S. They can also use the Internet to access the development servers at the client development site from the offshore center, with appropriate firewalls in place.

PwC India's offshore service portfolio now also includes:

SAP- ABAP 4 Programming: PwC India has about 300+ SAP consultants fully trained and certified in all principal modules of SAP R/3, including ABAP/4 and Basis. The Saltlake Technology Center (STC) is the main development center and PwC India have a number of live SAP sites, as well as several on-going implementations. SAP clients include Tetrapak, GoodYear and Pepsi.

Network Computing: including Lotus Notes, Internet / Intranet, Web Publishing and Java based application development. PwC India has wide technical expertise and experience in offshore development and maintenance in the field of advanced computing in emerging technologies.

Data Warehousing and Data Mining: PwC India has a group of nearly fifty consultants fully trained in the areas of Data Warehousing and Data Mining. This group is particularly experienced in executing data extraction, transfer and loading procedures of DW Software development life cycle. This group has provided assistance in three US projects for prestigious multinational clients. A trained resource pool, alliances with nearly all technology vendors, combined with strong project experience enables the group to execute offshore work to the client's satisfaction and within the specified timeframe. The group has worked on a variety of OLAP and Data Mining tools, including Oracle Express, Informix Metacube, Visual Warehouse, COGNOS PowerPlay and Impromptu, Business Objects, Microsoft Plato (OLAP Server 6.0), SAS, and Business Miner - using Oracle 8 and Informix 7.x as the data warehouse. Using the 512 Kbps IPLC line with the U.S., the group has constant access to the Data Warehousing COE knowledge base that PwC uses worldwide.

Relational Database Management Systems (RDBMS): PwC's experience in this area includes virtually all industry sectors – both in India and abroad. Almost all the development projects have been completed in PwC's technology center, following their offshore methodology. This has been possible since the STC has several large RDBMS servers, on all major operating platforms, which are dedicated to development activities.

Offshore Methodology

In the Off-line Approach the offshore developers shall be developing the programs and other deliverables in the PwC India's Development servers. The Unit test data, Unit tests job steps and the Unit Test Environment will be generated on the PwC India Server by the offshore team. On successful completion of the program development and Testing, the tested Program code shall be exported.

These exported objects will then be sent to the on-site coordinator as attachments to e-mail (Lotus Notes). The on-site coordinator, with the help of the system administration, will import these objects into the development server of the client. The programs can

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then be released for integration testing. Any problems that arise out of the testing (TPRs) can either be fixed at the client location itself by the on-site team or can again be sent to the offshore team using the same methodology.

The off-line method does not require any direct network connectivity between the servers located at the client site and the offshore location. This method has successfully been used for clients in the Indian market, located in remote locations requiring such services.

PwC's Strategic Positioning

The key differentiators of PwC's offshore services are considered:

- Strength of worldwide information and network infrastructure, including access to PwC's global centers of excellence for all industry types. Dedicated 512 KBPS IPLC links to their Tampa and Menlo Park offices enable easy communication.
- PwC India's Saltlake Technology Center, the 55,000 sq. ft. development facility is home to their local Management Consultancy and System Solutions practice and is ISO 9000 certified. Another larger facility in Calcutta, dedicated to emerging technologies, is under construction.
- Blending of Technology and Functional knowledge required to deliver the full spectrum of offshore services. A successful offshore project does not just deliver an IT solution, but also must consider the business strategy and processes of an organization.
- Vast experience in delivering offshore/ on-site solutions for both domestic and international clients - within time and cost budgets.
- A large pool of qualified, experienced professionals – backed by PwC's offshore methodology.

Case Studies

Tetra Pak, Sweden

Tetra Pak is the world's largest supplier of packing systems for liquid foods. The Tetra Pak iSDC (integrated Solution Delivery Center) SAP offshore project is one of the largest offshore projects ever delivered by PwC.

The Information Systems Platform (ISP) program is a multi-year business solution provided by PwC, that will roll out a common global solution to at least 25 countries, across all of Tetra Pak's lines of business. The Tetra Pak roll out plan is divided into Clusters. After successful Go-Live of Cluster 1 on 1st November 1999, the Tetra Pak team is currently working on Cluster 2 development with a planned Go-Live date of June 1st, 2000. Cluster 3, 4 and 5 will follow.

For the Tetra Pak assignment, the iSDC model was developed with a mirror or counterpart organizational structure between the on-site and iSDC team, with a strong communication channel being the foundation of the model. The iSDC team members will follow normal iSDC development methodology, tools (SDMS) and work closely with on-site application development team members in delivering the highest quality programs to Tetra Pak. Currently 25 team members (including 4 team leaders and a project manager) are dedicated to the project from iSDC, Calcutta. There are also 12 senior analysts and business process consultants stationed on-site in Sweden; helping the client to develop functional and high-level design specifications. The current workload estimate indicates that around 200 development objects will be developed for Cluster 2 from iSDC Calcutta, and be delivered by the end of February.

The iSDC team members are logging onto the Tetra Pak servers in Sweden using PwC's Global WAN – 256 kbps International Private Leased Circuit (IPLC) routed via Tampa, Florida.

Nigerian Agricultural Co-operative Bank

Development of Loan Administration System

In the first major offshore project that was completed by PwC India, a team of around 15 PwC India software professionals successfully designed, developed and delivered the Loan Administration System (LAS) - a mission critical application - for the Bank. The LAS was a key component in the overall computerization of the Bank.

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This 150 person month project, was developed by a joint team of Indian and Nigerian PwC consultants at the Software Technology Centre, under the leadership and management of PwC India. After the design and development phases were completed by PwC India consultants, a joint team from PwC Nigeria and PwC India worked on the system and acceptance testing. The system implementation in Nigeria was also under the supervision of PwC India consultants. As the Software Technology Center did not have a direct IPLC line to Nigeria, communication was routed through Lotus Notes replication between India and Nigeria via the London hub. As this communication was not always robust and fast it highlighted the need to have a direct high-speed line from the Technology Center to the outside world, resulting in the installation of the current 512 Kbps IPLC line.

This project was recognized by NASSCOM (National Association for Software and Services Company), the premier body for Information Technology in India as one of the major offshore projects undertaken by an Indian company in 1995.

Sample Customers

Customer	Industry	Service Provided	Project Details
GoodYear	Manufacturing	Custom ABAP 4 development of process mapping using user exits, design and develop reports and layout sets.	The technical development part of the project has been awarded to PwC India through a mutual contract with PwC UK. An offshore development approach was adopted, with the project team being divided into two parts. One team was stationed on-site in Istanbul and did the analysis and design, while the other team was in India for development based on design documents.
WCIS-Colorado	Insurance	Worker's Compensation Insurance System developed for the State of Colorado, USA.	PwC India developed a significant portion of the Worker's Compensation Insurance System that was developed for the State of Colorado. PwC India was in charge of developing reports, forms and correspondence and the needed interfaces between the forms and correspondence systems using SQR Workbench working off an Oracle 7.x database resident on a HP 9000 machine.
WCIS - Idaho	Insurance	Worker's Compensation Insurance System developed for the State of Idaho, USA	PwC India successfully completed data conversion required for the implementation of the WCIS system for the Idaho State Insurance Fund. This was part of an overall effort to migrate the legacy systems to a client-server platform, using Oracle 7.x as the RDBMS. The data conversion from DG-COBOL to Oracle 7.x was completed using SQR Workbench.
Law Firm Statistical Survey	Professional Service	Development of a user interface and reports for an annual law firm survey.	A joint team from PwC India and the U.S. has completed the development of a new law firm statistical survey framework. Analysis, Design, Construction using Visual Basic as the front-end and Installation from the Saltlake Technology Center, using Microsoft Netmeeting as the discussion forum.

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E-mail: info@input.com or sales@input.com

Software Ventures International

Contact Information

SVI America
A Division of Software Ventures International
6201 Fairview Road, Suite 200
Charlotte, NC 28210

Telephone: (704) 553 9051
Fax: (704) 553 8179

Mr. Ramon Sicam
Senior Vice President & General Manager (USA)
Email: rsicam@sviamerica.com

www.sviamerica.com

Company Background

Founded in 1986, SVI employs more than 1,500 IT professionals in the Philippines, the United States, Hong Kong, Japan, Canada and the United Kingdom. In 1998 global revenues exceeded US$20 million, with approximately 80% of that amount generated from the company's North American operations. In 1999, Citicorp and GE Capital made significant equity investments in SVI, which further stimulated the company's growth within the IT services industry.

SVI's growth and continued success are driven by its proven methodology for addressing the broad spectrum of corporate IT requirements for high-performance enterprise systems. This methodology encompasses such vital needs as Systems Maintenance, Systems Conversion, Application Development, Data Management, Networking and E-Commerce.

Regardless of whether the working relationship is long-term or project driven, SVI prides itself on always providing:

- Comprehensive, reliable documentation
- Strict quality control
- Extensive work-process measurement
- Proven groupware and other tools for project management
- Information repository and knowledge-base sharing
- Status reporting and daily communication

SVI is presently working toward ISO Certification. SVI's business partners include, Ayala Systems - FAS Tech, IBM and Itochu - ISI CSC.

Software Ventures International

- ✓ Strong maintenance and conversion capabilities
- ✓ Extensive expertise in analysis, design, and programming for a wide range of platforms and operating environments
- ✓ Proven offshore methodology with professional on-site interface
- ✓ Broad capabilities for Web site development and e-commerce implementation
- ✓ Additional capabilities for call center services and support, multimedia development and implementation, and data conversion services
- ✓ Extensive experience with US companies enhanced by communications compatibility and cultural synergy

SVI's Focus on the Future

Through their highly successful offshore projects since 1986, SVI has fostered good relationships with numerous companies across the U.S. and around the world. In fact, the professionalism and capabilities SVI demonstrated in numerous individual projects have led the majority of those clients to use SVI for ongoing production support, maintenance, and other development projects.

As the possibilities of information technology continue to expand, SVI has turned its attention and considerable resources to countless opportunities afforded by the Internet, especially Web-related business and e-commerce. For the foreseeable future, SVI expects to be busy Web-enabling existing enterprise applications for clients or developing totally new applications as the global business paradigm shifts.

Of course, as a value-added service provider, SVI continues to develop its business knowledge and application expertise to meet the challenge of change in the digital world. One of SVI's fundamental values is to co-invest with each client in a partnership where the business driver is the client; and SVI, the technology provider.

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Main Business Activities

SVI provides businesses with information management solutions for applications that cover a wide range of industries across the world. SVI's technical specialists are experts in analysis, design, and programming in a host of platforms and operating environments and have handled projects involving legacy systems, client/server systems, and Internet-related systems. They have subsidiaries in the United States, Canada, Japan and Hong Kong, and work with partners in Sweden, United Kingdom, Singapore, Malaysia and Indonesia.

SVI also provides a diversity of information development, distribution, and infrastructure services e.g. call center facilities, support, and services; Web site development and maintenance, CD-ROM development and production, network installation and technical support and traditional keyboard data entry with a capacity to generate over one billion keystrokes a month, as well as markup language and database buildup services.

Offshore Service Capability

SVI's greatest benefit to its clients comes from its ability to combine a professional on-site interface for its extensive offshore capabilities. The result is highly productive and cost-effective IT solutions.

Equally important, SVI's highly flexible operational structure allows the company to draw on different resources to provide the wide array of services under a project managed environment.

Thus, SVI can provide the following array of offshore capabilities:

Turnkey Systems Development - SVI develops information systems on a specification-construction-implementation basis. SVI takes on overall project management responsibility and draws on its global network of highly skilled IT professionals to fulfill each specific customer requirement.

Systems Conversion - SVI will convert existing computer systems from one hardware or software environment to another, while preserving the existing application functionality.

Systems Maintenance - SVI will maintain application systems and troubleshoot for clients, following very strict procedures with complete documentation of problems and solutions, while passing pre-agreed testing procedures. SVI will also establish a 24x7 Help Desk exclusively for client needs.

Mainframe to Client-Server Platforms - SVI has extensive expertise to convert mainframe applications into systems that can run on a client-server environment, without compromising the functionality the client depends on.

Networking - SVI provides supporting global connectivity to the latest access protocols, including Frame Relay, ATM, X.25, SNA, HDLC, and PPP. In addition, SVI builds, administrates, and maintains networks for companies who wish to develop their own Intranet/Extranet environments. SVI also enables seamless integration of numerous multimedia applications and provide ongoing technical support services.

Contract Programming - For companies with their own information systems specifications, the highly skilled SVI global work force can be mobilized for systems construction, even at short notice, utilizing SVI's tested and proven methods and procedures in conjunction with a strict supervision and assessment protocol.

Facilities Management - For companies requiring more time for transfer and training, SVI makes sure existing work schedules are not disrupted, by managing data center facilities until the client's own personnel can take over the operations.

Management Information Systems Planning and Consultancy - Following IBM's Business Planning Systems, SVI will develop a comprehensive information systems plan based on a client's specific business goals while carefully considering the existing information systems setup.

General Consultancy - SVI's professional IT consultants provide vital guidance and advice regarding hardware selection and configuration, high-level IT planning, environmental planning and setup, data center setup, and other specialized areas.

Web Site Development - SVI creates, implements, and maintains integrated Web-based E-Commerce applications. Depending on the client's requirements, Web sites can be as simple as a few basic pages or as complex as hundreds of pages with dynamic content, such as animated GIFs or digital video clips.

Internet-Ready Databases - Most production databases are not Internet-ready. SVI will readily modify these databases to allow secure information input and availability (either universally or protected) through the Internet.

SVI's Expertise

Industry Knowledge: SVI's experience ranges across the following industries; telecommunications, transportation (airline, shipping, trucking), pharmaceuticals/chemical, publishing/media, banking, insurance, brokerage, manufacturing, energy/gas, retail, healthcare and government.

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Product Platforms: SVI has experience on the following platforms:

Operating systems: Unix, MVS, VSE, OS/400, AIX, HP UX, Solaris, Windows 9x/2000/NT
RDMS: IMS/DB, DB2, Oracle, Sybase, SQL Server, Informix, Adabas, xbase
Languages: Assembler, Cobol, C, C++, Fortran, Pascal, PL1, Java, HTML, Powerbuilder, Delphi, Visual Basic, Visual C++, SAS Natural
Teleprocessing: CICS, IMS/DC, TCP/IP
ERP: SAP, Oracle
E business: Web Development, E-commerce
Hardware: Routers/Hubs, Sun Workstations

SVI's Strategic Positioning

Strong working relationship: SVI makes a consistent effort to look beyond the technical details to develop a full appreciation not only of a company's IT needs, but also of its business. SVI believes that by learning about each client's business, they can provide more effective, high-value solutions. By getting to know the "how and why" of a business, SVI can fully assess how their efforts will impact the business. This sensitivity to business culture allows SVI to make high-value recommendations and smoothly develop integrated IT solutions. In short, SVI is committed to working with a spirit of partnership that focuses on flexible solutions rather than rigid "by-the-book" procedures.

SVI speaks your language: Beyond professionalism, beyond technical expertise, and even beyond manpower, SVI's single greatest advantage is communication compatibility. Not only does the onshore, on-site team speak your language, but the offshore team does, too. Every step of the way at every level of the partnership, clients encounter a professional and cultural synergy that is invaluable in achieving maximum performance at minimum cost, both in dollars and in peace of mind.

The personal touch: SVI provides a person-to-person, on-site interface that assures both high-quality results and prompt, effective response to client needs and requirements, while drawing on a vast network of talent and resources in the US, Philippines, and around the Pacific Rim.

Case Study

A Major International Airline

Since 1996 SVI has been working with one of the five leading international airlines to provide them with production support, systems enhancement and development, as well as systems conversion. SVI's initial efforts involved the Y2K conversion of the airline's crew management system that encompassed more than 300 programs, its passenger revenue accounting systems involving more than 1,500 programs, and its payroll system for ground personnel that comprised of more than 100 programs.

In less than a year, SVI's professionalism and effectiveness on the Y2K projects led the airline to expand SVI's involvement to include systems maintenance projects. To date SVI is providing offshore production support and application development services.

The Airline has three major portfolios with a total of 12 groups of systems. SVI is currently supporting five groups of systems with 21 on-site staff and 65 offshore staff. Systems supported offshore are:

Passenger Revenue Accounting (Sales, Usage, Support)
Flight/Crew Operations (Autoawards, Legalities, Line, Pattern, CMS support, Flight attendant payroll)
Human Resources, Finance and Administration (Finance, Pace, Passenger Travel, Other HR Systems, HR support and Information Center, Time Reporting and Safety)
Airport Operations Systems (Ground and In-flight support)
Cargo, Fuel & Stats (Decision systems, fuel management and statistics).

A Team Approach that Works!

Additionally, long-running jobs were considerably shortened by SVI's implementation of preventive maintenance tasks. The airline's problem information database has been updated and ad hoc reports are now generated on time.

Four key factors account for SVI's effectiveness. First, SVI's methodology defines the process that SVI adheres to in the performance of its services. Second, SVI's organizational plan spells out the responsibilities of each of the parties concerned – on-site, offshore, and users. The third key factor is SVI's toolset that includes a project information repository, a project management facility, a job assignment and status tracking system, and an open discussion facility built on top of a corporate GroupWare system. SVI's quality assurance process establishes and monitors a system of phased deliverables and reviews.

SVI prides itself on its strict quality assurance standards and structured methodology for all the services the company offers. As a rule, each type of engagement has distinct phases with predefined milestones and deliverables that assure effective project control. The phases involved for each type of engagement are shown in the table on the following page.

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Development	Maintenance	Conversion
Requirements	Job Monitoring	Scoping
Design	Problem Identification	Analysis
Construction	Problem Analysis	Conversion Specifications
Testing	Problem Resolution	Conversion Proper
Documentation	Documentation	Documentation
Implementation & Production	Implementation & Production	Implementation & Production

In its work with the airline, SVI's engagement employed three distinct components that make up a typical support team:

1) an onsite team of programmer/analysts,
2) an offshore team of programmers and analysts, and
3) a Technical Review Board.

Typically, SVI's on-site-to-offshore staffing ratio is:

Development: 1 on-site to 6 - 8 offshore (depending on application and platform)
Maintenance: 1 on-site to 3 - 4 offshore
Conversion: 1 on-site to 15 offshore

SVI's on-site team serves as a front line liaison with the airline's staff and the airline's end users for the duration of the entire effort. The on-site team makes the offshore component of the project transparent. In fact, the on-site team can be thought of as consultants or contracted additions to the airline's data processing staff, performing the same role as the airline's own analysts and designers. The only difference is SVI's team has access to an independent back room construction team located offshore.

SVI's offshore team serves primarily as a "coding factory." Situated in Manila, this team consists of a project manager and a fixed team of programmer/analysts plus additional programmers working as needed to perform the support function. In cases where simultaneous requirements need manpower in excess of the team size, SVI augments the core team with personnel drawn from other IT services groups.

The basic operational concept is: the on-site team generates program and revision specifications which are performed by the offshore team. To assure smooth coordination, the teams are in constant, close communication by telephone, fax, e-mail, and Internet connections. SVI's Global Management Center – a Web-based tool – is used to initiate, assign, and monitor the workload among the team members.

For every project SVI works on, a quality assurance group called the Technical Review Board is convened to ensure compliance to quality standards. The Technical Review Board is the SVI auditor for quality. It enforces adherence to processes, standards, use of tools, and all other aspects of quality assurance. The Technical Review Board is composed of highly experienced senior personnel who act as consultants and review all major or critical requirements of each project. The Board also involves team members as peer reviewers to allow them the opportunity to assimilate best practices. Periodically, the Board conducts "surprise" audits of the on-site and offshore processes to ensure that the teams are adhering to quality standards.

Measurements and control are integral parts to the quality assurance process. SVI believes that effective control is possible only with measurement. Metrics are compiled on all aspects of the process. The job creation and assignment facility is time stamped as each job flows throughout its predefined phases. This allows clear measurement of task accomplishments and duration of each related activity from inception to completion.

SVI programmers electronically log their input hours for predefined phases of work on a project allowing SVI's software metrics to be gathered for each phase and type of activity. Tracking input hours provides a good measurement against output for each engagement.

Results that Make a Difference

By engaging SVI as their outsourcing partner, the airline is realizing significant benefits. For a start, their employees have gained more control of their lives after office hours since SVI now takes the beeper calls – meaning the airline no longer has to provide extra pay for IT staff to carry beepers. Operationally, the backlog on trouble reports was wiped out by SVI's production support team. Contract changes were implemented on time and contingencies were in place when needed.

By taking advantage of SVI's on-site/offshore approach, the airline has the additional bottom-line benefit of the comparatively lower labor rates available in Manila and the limited higher cost labor of the relatively small on site team.

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E-mail: info@input.com or sales@input.com

Sonata Software

Contact Information

India Office
Sonata Software Ltd.
APS Trust Building, Bull Temple Road, NR Colony,
Bangalore - 560 019

Telephone: (91-80) 661 0330
Fax: (91-80) 661 0972

V. A. Ramakrishna
Assistant Vice-President
Email: vara@sonata-software.com

U.S. Offices
Sonata Software
242 Old Brunswick Road, Suite 100
Piscataway, NJ 08854.

Telephone: (732) 562 1668
Fax: (732) 562 1669

Venkat Ramani
Email: venkat@sonata-software.com

14798 Wicks Boulevard,
San Leandro, CA 94577

Telephone: (510) 614 6220
Fax: (510) 483 5978

Manoj John
Email: manoj.john@sonata-software.com

U.K. Office
Suite 202, Pentax House, South Hill Avenue
Northolt Road, South Harrow
Middlesex, UK HA2 0DU

Telephone: (44) 181-9384611/2
Fax: (44) 181-9384623

Vivek Desai
Email: vivek.desai@sonata-software.com

www.sonata-software.com

Sonata Software

- ✓ Strong focus on E-Commerce, Enterprise Applications, Business Intelligence and Groupware
- ✓ Offers offshore development and consulting services
- ✓ Strategic alliances with Microsoft, IBM, Oracle, Lotus, Computer Associates and Scala
- ✓ Mature project management: experienced in large-scale and multi-site projects

Company Background

Sonata Software has a 14-year proven record of success through innovation in the U.S. and European markets. The company, with their state-of-the-art, cutting edge infrastructure facilities, offers software development, software products, consulting and ERP services to clients.

With overseas offices in the U.S. and UK, Sonata markets its services and caters to customers, including Fortune 500 companies, in 20 countries across North America, Europe and Asia. Sonata Software has been an ISO 9000 TickIT certified company since 1994. As part of a continuous process of improvement, Sonata is presently implementing quality systems for conformance with SEI-CMM.

Fiscal year 1998-99 has been a watershed year for Sonata in many ways. The company made its maiden public offering and closed up 250% on the issue price, during trading on the first day. The company posted revenues of US$30 million, a growth of 48% on the previous year. With significant productivity improvements, Sonata now employs more than 850 professionals.

Sonata's concerted drive to increase export, or offshore revenues has been a key factor in their recent success. Over the last four years, Sonata's software service revenues have grown at 100% CAGR.

Sonata has strategic alliances with Microsoft, IBM, Oracle, Lotus, Computer Associates and Scala, giving them the unique advantage of providing the latest technology and functionality to clients. Technology transfer from alliance partners has also given tremendous leverage to their offshore software development services. Moreover, they also possess one of the largest Microsoft and Lotus certified skill bases in India. The dedicated Core Research Group reinforces these strategic advantages by continually absorbing the latest technologies and incorporating them into service offerings to better meet customer requirements.

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Main Business Activities

Sonata's portfolio of offerings are threefold:

Software Services: Application Development, Product Development, IT Consulting, Re-engineering, Maintenance.

eCommerce Services: Application Development, Web-enablement, Re-engineering, Business Intelligence, Technology Deployment.

Technology Areas: Object-oriented Engineering, Enterprise Solutions, Business Intelligence and Groupware.

Offshore Service Capability

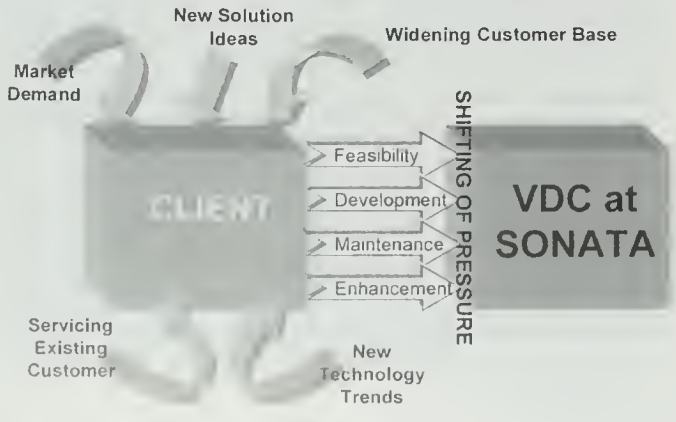
Sonata believes that selective outsourcing is a strategic imperative to import critical skills into an organization.

Sonata offers offshore development and consulting services and has executed numerous projects in areas ranging from re-engineering and platform migration to product development and maintenance. The valuable man-years of experience, gained from the execution of these projects, have allowed them to continually refine their offshore software development into an extremely effective model.

To give its clients utmost value for their investments, Sonata uses a distinctive approach of service delivery that combines onsite and offshore resources, whereby the teams are deployed in a flexible fashion throughout the Project Life Cycle. This approach ensures '**convenience of on-site presence & cost efficiencies of offshore teams**', thereby providing value for every development dollar invested. From a time-to-market perspective, this approach is a "win-win" situation for the client, according to Sonata.

At Sonata, this model is represented by the Virtual Development Centre (VDC) that works as a dedicated and seamless extension of the client's IS group.

VDC- The Value Proposition



The IS imperatives facing the client include new technological trends, servicing existing customers, new solution ideas, market demand and widening customer base. Sonata's VDCs address these imperatives and give the client continued access to key skills besides managing the complexities of system development. Thus, clients leverage outsourcing to stay competitive.

The Sonata model is all-encompassing and comprises the following elements:

- Process Model: Though a proven process model, a two-way transfer of knowledge with respect to application, technology, development processes and standards takes place.
- Seamless Network: Establishing communication links between the client location and Offshore Development Center to ensure a seamless network.
- Establishment of a project management and review process with mutual consent.
- Dedicated Team: Formation of a dedicated group of software professionals - partly on-site at the client's location and partly offshore at Sonata's development centers in India.
- Technology Exploration and Proof of Concept: Understanding and acquiring technology from vendors and developing proof of concept prototypes offshore.
- Developing prototypes for functional enhancements of product to assess architectural impact and implementation issues.

Sonata's Strategic Positioning

Sonata's strategic differentiators in offshore services are considered as follows:

- Mature project management: large-scale, multi-site project experience
- Established quality systems
- Availability of multiple skills
- A flexible delivery mechanism

A 24-by-7 paradigm will become indispensable in delivering the gamut of software services in the future. With clients worldwide reaping the benefits of its cost-competitive offshore services, Sonata has converted this business promise into a delivery paradigm.

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Core Research Group

A reflection of Sonata's commitment to research and development, the Core Research Group is a dedicated team of more than 50 professionals that work to assimilate new technologies into Sonata services. Specifically, the team is responsible for:

- Ensuring that Sonata is well-prepared in emerging technology areas
- Building new businesses based on new technology capabilities
- Handholding project teams in addressing these new businesses.

Future-Mapping by Sonata

eCommerce: The Internet has become the cornerstone of a new industrial order. However, to seize the opportunities offered by the Web, expert advice is needed, as well as the right tools and an intelligible plan to navigate a clear path and leverage this extraordinary power.

Business Intelligence: Data, to be really useful, has to be translated into 'business intelligence' for clients -- this is how Sonata views data warehousing. In too many cases, the potential and value of business data that businesses have been amassing have not been fully exploited. Data warehousing and data marts are the enabling technologies that provide organizations with an end-to-end solution for managing, organizing and exploiting data throughout the enterprise.

Groupware: Sonata believes that by deploying groupware infrastructure, companies can leverage knowledge and co-ordinate the flow of work both within and across boundaries.

Case Studies

Blue Shield, California

Blue Shield of California is one of the state's leading health care companies serving more than 2 million members.

Project Background & Objectives

Blue Shield had implemented Diamond 950, a client-server managed healthcare software solution developed by Health System Design, CA. The implementation of the Diamond system was part of Blue Shield's migration strategy from its legacy mainframe system to client-server, with Oracle as the key database architecture. Blue Shield also had some unique reporting requirements from Diamond 950.

Blue Shield selected Sonata as their strategic development partner. Specifically, they required Sonata to augment their migration and development effort by establishing a seamless development team, working both on-site and Offshore.

Project Details

- Development of an interface between the mainframe legacy applications and the newly architected Client Server applications using DataGate. DataGate uses a hub-and-spoke architecture for application integration, resulting in better efficiencies through reduced operating costs and improved access to information.
- Sonata provided a DBA team to work on the development architecture.
- Generation of a set of 16 reports for the Provider Module of Diamond 950.
- Conversion of database objects of the Sales Module from SQL Server to an Oracle database. The sales system previously in SQL Server was converted into stored procedures and triggers in Oracle.

Scala Business Solutions NV, Sweden

Scala, developed by Scala Business Solutions NV, is an international Enterprise Applications System with over 14,000 installations in 90 countries worldwide.

Sonata's relationship with Scala began with the enhancement, customization and implementation of Enterprise Applications for local markets, with them later maintaining the system as part of the client's global support infrastructure. Today the relationship has evolved to a stage where Sonata is an integral part of the team that is redesigning and reengineering the Enterprise Applications solution. Sonata is also strategizing, designing and developing eComponents for the client's award-winning "Dot Solutions". Currently, a team of around 100 Sonata professionals are engaged with the client in a variety of high-value roles.

Sonata Engagements

1995: Localization of the system, including enhancements and customizations

1997: Purchase Module re-engineering, including moving the application to 3-tier client-server architecture and Web-client support

1998: Implementation of Euro currency compliance

1999: Development of the eBusiness Suite; including strategy, design and development of components.

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Online Sporting Good Retailer

The Client is an online sports goods store, one of the largest of its kind in the United States. The virtual store offers consumers products like Jerseys, Caps and Trophies, while also helping them to customize their purchases in terms of variables like decoration, layout and style.

Project Objective

The aim of the project was to address B2C interaction by developing a Team Sales Wizard for the Client's site. The various options would be presented to the user in the form of a customization wizard. Users would then be able to customize their choice of uniform to the layouts, colors and material they require and place the order through the Team Sales Wizard.

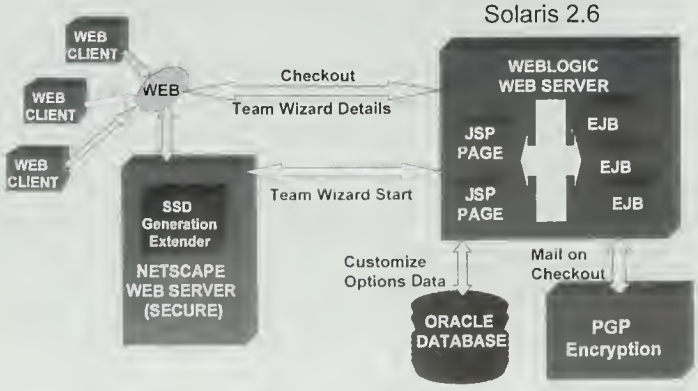
All the customization wizards had to be newly developed in the WebLogic environment using JSP/JHTML, EJB and Oracle database.

Project Details

The technical deliverables included the following:

- Application Architecture was developed for the "Team Sales Wizard".
- Database Design and Excel template developed for properties of different uniform items.
- Design Documents created for the "Team Sales Wizard"
- Source Code and executable for the "Team Sales Wizard"
- Developing business logic components that communicate between JSP/HTML and the Database, and also provide processing logic involved.
- Technology Platforms included Oracle 8.x database, WebLogic Application server, Java and SUN Solaris.

Team Sales Wizard Deployment Architecture



The project delivered the following B2C functionalities:

- A sequence of JSP/HTML screens that enable online purchase of jerseys
- Cost computation and discount options to customers based on quantity ordered and promotional discount codes.
- Editing, managing and saving of orders and
- Enablement of credit card payment for orders made.

Client Testimonials

"We have been really pleased by the work performed by Sonata. This specifically for the selection of the most appropriate technologies, the timing of delivery and by the huge level of flexibility."

Benedicte Saint-Guillain
Senior Manager (Biostatistics)

SmithKline Beecham Pharmaceuticals

"As you know, the ITSG organization, while young is poised to achieve great things. Your exemplary performance will be one of the key factors for our continued high performance as an IT organization. You set the standard."

Melodie Mayberry-Stewart
Senior Vice-President and Chief Information Officer

Blue Shield of California

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E-mail: info@input.com or sales@input.com

Zensar Technologies

Contact Information

U.S. Office
Zensar Technologies Inc.
8500 College Boulevard,
Overland Park, KS 66210

Mr. Sunil Kunte
Senior Vice President (Corporate) & CEO N. America
Telephone: (408) 436 3529
Fax: (408) 436 3544
Email: S.Kunte@zensar.com

Mr. Udayan (Dan) Mukhopadhyay
Director, Mission Plus
Telephone: (913) 338 7164
Fax: (801) 705 1538
Email: umukhopadhyay@icim.com

Mr. Mark Noronha
Western Regional Manager
San Jose, California
Telephone: (408) 436 3535 ext. 5211

Mr. Surendra Kapse
Eastern Regional Manager
East Brunswick, New Jersey
Telephone: (732) 214 2627

Mr. Saumit Desai
North Central Regional Manager
Schaumberg, Illinois
Telephone: (847) 925 5420

Principal office
Zensar Technologies Ltd.
Mile Post No. 4, Nagar Road
Pune - 411 014
India

Telephone: (91-20) 668 4001
Fax: (91-20) 668 2915

Mr. L.C. Singh
President & CEO
Telephone: (91-20) 669 1965
Fax: (91-20) 669 1964
Email: lcs@zensar.com

www.zensar.com

Zensar Technologies

- ✓ Wide range of branded service offerings, including mission critical application development and maintenance, enterprise-wide application support and process consultancy
- ✓ Expertise in eCommerce and networking
- ✓ Strategic alliances with technology leaders, such as Oracle, Microsoft, Siebel, and IBM
- ✓ The world's first enterprise-wide SEI-CMM Level 5 company
- ✓ Worldwide engagement capability

Company Background

Zensar Technologies, Inc. (formerly known as ICIM International Inc.) is a wholly-owned subsidiary of Zensar Technologies Ltd (formerly known as International Computers (India) Limited or ICIL) and is a global Information Technology organization with more than 10 years of experience supporting Fortune 500 clients. Their expertise is in providing complete applications management services that help enable customers to better manage their IT environments, improve time to market, and fully utilize technology to address key business initiatives.

Zensar's five offices in the United States keep them in close touch with clients as their requirements evolve. Zensar has international offices in the United Kingdom, western Europe, the Middle East, Japan, Australia, Singapore, Hong Kong, South Africa and an impressive state-of-the-art software development campus in Pune, India. This ensures that they are able to address the needs of their multinational clientele.

Zensar is amongst the leading software exporters from India, with an annual turnover exceeding US$ 44 million. Their leadership credentials in quality-centered development was recognized when Zensar (then known as ICIL) was assessed as the world's first enterprise-wide SEI-CMM Level 5 (Software) company in February 1999. Previously Zensar had received ISO 9001 certification in March 1994 and EFQM (MAIT) Level II in January 1997 (and are working towards achieving Level III in early 2002). They have also initiated efforts in People CMM. This focus on quality is at the core of their commitment to constantly improve the value proposition to clients.

Zensar's rapidly growing staff of more than 1,200 highly qualified software professionals have been recruited from the leading universities and impressive industry backgrounds. The company provides over

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20,000 person days of training each year and has a strong focus on research and development.

Zensar possesses extensive computing infrastructure incorporating the very latest technologies, including dedicated voice and data lines that link their worldwide locations. Zensar also has eight well-established Centers of Excellence spanning most major technology platforms.

Zensar has forged strategic technology partnerships with global IT leaders, including Microsoft, Oracle, IBM and Siebel. Zensar is actively pursuing further strategic alliances with market leaders in various industry segments and is also evaluating acquiring organizations with focused domain knowledge.

Main Business Activities

Mission Plus[SM] – This is Zensar's branded service for development, maintenance and enhancement of mission critical applications. The Mission Plus mandate is to provide the support customers need to improve their ROI on the application, while also freeing their internal staff to address core business initiatives. Mission Plus is supported by world-class people, technology, processes and tools. Zensar possess expertise on mainframe and mid-range systems and undertakes turnkey Web-enablement of legacy systems.

Enterprise Applications Group[SM] - This branded service is focused on supporting a customer base that has chosen Oracle Financial and Manufacturing Applications. Enterprise Applications Group brings special expertise for customers who need to extend their enterprise using Customer Relationship Management, Supply Chain, or eBusiness solutions.

BlueChilli.Com[SM] - Offers end-to-end B2B and B2C E-commerce solutions ranging from branding, strategizing, architecture, technology and Web-mining, with a particular focus on integration into Microsoft-based environments.

SystemSoft[SM] - Provides networking and other Systems Software solutions to major network equipment manufacturers, such as Fujitsu of Japan and other middleware vendors.

ProcessPlus[SM] - Provides consultancy in software process improvement based on SEI-CMM and ISO 9000 providing Gap Analysis, action planning and implementation support.

Offshore Service Capability

Mission Critical Applications

Zensar possess the skills and extensive expertise required for handling mission critical applications running on a wide range of platforms. Their dedicated Offshore Development Centers (ODCs) provide application support (On-call fix-on-fail, other SLA based maintenance, preventive and adaptive maintenance and enhancements) to leading corporations (e.g. Sprint).

Zensar methodology recognizes the pivotal importance of face-to-face communication with clients. Every engagement includes an Onsite Project Manager to handle customer interaction, inquiries, requirement finalization and delivery review. Zensar's Offshore Development model capitalizes on time differences between their international locations to deliver cost effective 24 x 7 support. This approach is known as the "Follow-the-Sun" methodology. The inherent scalability of this approach, combined with their focus on quality deliverables, results in a significant reduction in a customer's lead-time to market. However most importantly, this approach frees valuable in-house IT resources to focus on delivering new technology initiatives that are at the heart of today's dynamic corporate strategies.

Enterprise Transformation Strategy and Implementation

Zensar's Enterprise Application Group is an Oracle alliance partner, with a focus on serving customers that have chosen Oracle as their back-bone ERP application. Enterprise Applications Group has completed a number of large and challenging implementations of Oracle applications.

Enterprise Applications Group provides ERP services to corporate clients worldwide in the areas of business, functional and technical consulting for the implementation, upgrade and support of Oracle's enterprise application packages. The services offered by Enterprise Applications Group include offshore / onsite projects, tools and utility development, onsite consulting, and retainer based applications support. Enterprise Applications Group helps its customers identify and implement strategies to extend and integrate their enterprise systems through Customer Relationship Management (CRM), Supply Chain and eBusiness initiatives.

Zensar has also entered into a technology alliance with Siebel Systems, Inc. to develop best-of-breed front office solutions. Zensar aims to help its customers benefit from increased sales productivity, improved sales effectiveness, lower operating costs and increased customer satisfaction.

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BlueChilli.com

Zensar has introduced BlueChilli.com, a high performance team that works with high velocity middle market companies and dot.com startups to transform them into eBusinesses. BlueChilli.com combines a deep understanding of the New Economy issues with integrated, end-to-end services and a proven track record of shared risk and rapid guaranteed delivery

BlueChilli.com offers a 4-phase iterative process that enables building an eBusiness in six months or less and keep extending the function with new products and services, new customer interfaces, enhanced performance, security and capability.

Zensar has entered into a strategic technology alliance with Microsoft as their Premier Electronic Commerce Solutions Partner. Zensar expects to leverage its rich domain expertise along with the latest Microsoft technologies and tools to create products and branded solutions for E-commerce markets worldwide.

The company is currently working on a variety of Web products and embedded software, which will be launched as separate offerings and services.

System Software Solutions

Zensar's SystemSoft provides services in the areas of Systems Software such as Middleware products, Data Warehousing and Data Mining, Compilers and other Language Tools, Networking, Database Access Tools, Test Software, Multimedia Products, Embedded Systems, etc. The services include complete development life cycle services, i.e. Analysis, Design, Development and Testing. The services are provided either on-site at customer locations or offshore at any of Zensar's development centers to suit time scales, availability of skills and facilities and cost.

The skills in System Software include Operating System internals, Device Drivers Development, Database Internals and Middleware. Some specific skills include Unix and Windows NT/2000, Java, C and C++, OO and OMT, CORBA and DCOM, VB and VC++, VRML formats, Multimedia, Windows CE, Embedded NT and other real time operating systems.

Process Consultancy

Zensar is the first organization in the world to achieve an enterprise-wide level 5, the top level in the Software Engineering Institute's Capability Maturity Model (CMM) assessment. With a history of process adherence and achieving various certification levels, Zensar is in an ideal position to provide consultancy to customer IT organizations, in terms of Gap Analysis, action planning, process documentation, training, process auditing and process assessment.

Case Studies

Sprint

The main objective for the client was access to additional development bandwidth, without incurring the expense of additional facilities or personnel recruitment.

Application Maintenance

Initially analysts were placed with the existing client team onsite and a critical mass of people went through the knowledge transfer exercise. Most of the team then returned to India and enhancement work commenced. The offshore processes for production support with SLAs were reviewed and fine-tuned. In a phased manner the support was transferred offshore. Today the onshore team supports the daytime application issues (on-line), while the offshore team supports overnight (U.S. time) batch processing.

The work methodology and processes were tailor-made to Sprint's internal working mechanisms, yet remained close to Zensar's internal way of working (based on processes on which Zensar has been assessed to be at CMM level 5 enterprise-wide).

Web Enablement

Zensar has undertaken a variety of projects to Web-enable Sprint legacy systems including:

- Web-based decision support system
- Web-based time sheet submission system
- Web-based payroll inquiry system for employees
- Web-based employee skills tracking system

"(Zensar) has been doing an excellent job in maintaining some of our mainframe, mid-range and Intranet / desktop applications from their offshore center in India. We are pleased with their ability to deliver under very tight schedules. Their Onshore Analyst / Offshore Developer model has proved to be very effective. They have consistently met our time, cost and quality targets."

Daniel Diggs
Vice President IS/SD, Sprint

Cisco Systems

Cisco Systems encountered enormous challenges while undertaking the planning for their 10.7 Oracle Applications "Millennium" upgrade project.

"While we have over 1500 customizations to the application, 700 of them are reports. We anticipated the effort to port the reports to 10.7 would put a significant strain on our internal resources that might shift our team focus away from other highly critical issues. This concern led us to look for a partner who

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would be capable of taking the project offsite or offshore. We chose the Enterprise Applications Group".

"Functionality, schedule, quality, and budgetary goals have been consistently achieved by Enterprise Applications Group. Most importantly, Enterprise Applications Group has demonstrated a highly successful methodology for taking Oracle Applications technical work offshore, which has allowed Cisco Systems to maintain the business focus of its IS Applications 'Millennium' project."

Andy Starr
Director and 'Millennium' Project Manager,
Cisco Systems

Web-Enablement

After successful completion of the Oracle reports upgrade project, Cisco has implemented a proactive process to identify other projects that are suitable for offshore development. The focus of these projects is on development and maintenance of various internal Cisco Web-based systems, including;

- Training partners on the management system
- Tracking best practice for project management
- Field sales tracking
- Customer satisfaction tracking

As well as several other projects now in development.

Sample Customers

Customer	Industry	Service Provided	Project Details
Sprint	Telecommunications	Ongoing application maintenance and project development.	• Offshore maintenance of mission critical application on mainframe • Provided enhancements to the application, developing Web-based applications, porting, and Web interfaces to legacy IBM systems
Cisco Systems	Telecommunications and switching equipment	Application development and maintenance	• Developed a customer information system • Worked on other Web-based applications
P&O Nedlloyd	Shipping	Application development	• Shipping / customer data analysis for sales, marketing and trade organization in Oracle 8.0
Dixons	Consumer durable retail	Application development	• After sales service contract management Customer Information System in high-end Unix environment

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INPUT Services For Executives

INPUT conducts a variety of research-based projects for decision makers. Projects are selected in consultation with sponsors, and focus on topics of high and immediate value to sponsors. The value proposition of IT executive projects is that they are based on original research as opposed to opinion.

Projects cover the following IT and business sectors:

- Electronic Commerce
- Electronic Banking
- Electronic Government
- Enterprise Application Solution
- Internet & Intranets
- IT Customer Services & Support
- IT Operational Services

INPUT's decision maker projects:

- Enable vendor selection based on organised data from research with active buyers and users
- Support buying decisions on systems, software, services and processes
- Provide data, analysis and advice for strategic and tactical planning
- Support communications on industry developments and strategies with users, vendors and management

In addition, INPUT offers the following services:

- Extensive analysis and assessments of the world's leading IT vendors
- Comprehensive programmes of market forecasting for all leading IT markets worldwide
- Custom research projects
- Client presentations

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INPUT®

Head Office

1921 Gallows Road
Suite 250
Vienna, VA 22182 3900
U.S.A.
Tel: +1 (703) 847-6870
Fax: +1 (703) 847-6872

Asia/Pacific Regional Office

6 Battery Road #22-03
Singapore 049909
Tel: +65 423-0614
Fax: +65 423-0654

